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FINAL REPORT
RCRA FACILITY ASSESSMENT
YAKIMA AGRICULTURAL RESEARCH LABORATORY
YAKIMA, WASHINGTON

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JACOBS ENGINEERING GROUP INC.
ENVIRONMENTAL SYSTEMS DIVISION

IN ASSOCIATION WITH:
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U.S. ENVIRONMENTAL PROTECTION AGENCY
TECHNICAL ENFORCEMENT SUPPORT
AT
HAZARDOUS WASTE SITES

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FINAL REPORT
RCRA FACILITY ASSESSMENT
YAKIMA AGRICULTURAL RESEARCH LABORATORY
YAKIMA, WASHINGTON

TETRA TECH, INC.
FOR
JACOBS ENGINEERING GROUP, INC.
PROJECT NUMBER: 05-B392-00
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1.0 INTRODUCTION

Tetra Tech, Inc. was contracted by the U.S. Environmental Protection Agency (U.S. EPA) to perform a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) for the Yakima Agricultural Research Laboratory (YARL) in Yakima, Washington. The objectives of an RFA are to identify and gather information on releases at RCRA-regulated facilities, to evaluate a facility's solid waste management units with respect to release of hazardous materials to all media, and to determine the need for further actions and interim measures at the facility. This report combines the findings of the preliminary review (PR) phase and the visual site inspection (VSI) phase of the RFA under the RCRA corrective action program. The PR and VSI were conducted following the U.S. EPA (1986) RCRA facility guidance manual. As a result of the PR and VSI, some data gaps have been identified.

1.1 PRELIMINARY REVIEW

The PR of YARL was conducted by examining and using information in U.S. EPA Region X and Washington Department of Ecology (Ecology) files. The following documents were reviewed:

- Closure/post-closure plans
- Wastewater facility soil, sludge, and groundwater sampling reports
- Correspondence
- Facility inspection reports.

The information gathered from these sources was used to identify and characterize potential releases from the facility and to focus the activities to be conducted in subsequent phases of the RFA.

1.2 VISUAL SITE INSPECTION

The VSI for the YARL facility was conducted on 9 September 1987. The inspectors arrived at the site and met with YARL director, Mr. Robert E. Dolphin. The opening meeting focused on the facility's waste management practices. Specifically, the types of waste the facility handles and the operation of the facility's septic tank were discussed in detail. Following the opening meeting, Mr. Dolphin showed the inspectors the site. Mr. Eric Halfhill, research entomologist at YARL, joined the group during the site inspection. Photographs of waste management units were taken. A brief closing meeting was held to discuss observations made during the site inspection.

1.3 AVAILABILITY OF DATA/DATA GAPS

Groundwater quality data are not available for the facility wells because quarterly sampling has not commenced. Well logs for the two domestic wells ((b)(6) and (b) wells) located less than 1 mi south of YARL are not available. Water quality has not been monitored in any of the surrounding wells, making it difficult to assess the extent of groundwater contamination.

Soil sampling data collected in 1983 were available from YARL and Ecology. Additional soil sampling has not been conducted. More recent soil analytical data would have allowed a more comprehensive evaluation of the nature and extent of soil contamination.

Information regarding names and specific quantities of chemicals disposed of directly to the septic system does not exist.

1.4 PROJECT CONCLUSIONS

It has not been determined whether the groundwater beneath the site is contaminated. A number of factors may reduce the potential for groundwater contamination. The organochlorine pesticides routed to the drainfield are

relatively immobiles because of their low water solubility and high attraction to organic and mineral colloids in the soil. The high evapotranspiration rate and the fine textured layer of soil beneath the drainfield may retard downward migration of contaminants. In most cases, organophosphate and carbamate pesticides decompose rapidly in the soil because of chemical and microbial activity.

The groundwater monitoring wells installed at YARL in 1988 have not been sampled to date (Comstock, N., personal communication, 9 May 1988). Nearby domestic wells have not been sampled for pesticides. The soil sampling plan outlined in the facility's closure plan has not been implemented to date.

The soil monitoring plan proposed by YARL will be implemented in June 1988. The plan was designed to determine the nature and extent of soil contamination beneath and adjacent to the septic tank drainfield. The plan includes provisions for collection and analysis of soil samples to define the vertical and lateral extent of soil contamination.

1.5 PROJECT RECOMMENDATIONS

Potential groundwater and soil contamination associated with the septic tank drainfield will be handled in the closure and post-closure process. The groundwater monitoring wells installed at YARL in April 1988 will be sampled and analyzed for pesticide constituents. Water table elevations will be recorded on a quarterly basis to identify groundwater flow direction and seasonal variations. If contaminants are detected in these wells, an extensive hydrogeologic assessment should be implemented. This assessment should involve installing additional downgradient wells, conducting permeability and shallow aquifer tests, and sampling surrounding shallow domestic wells.

2.0 DESCRIPTION OF FACILITY AND WASTES GENERATED

2.1 FACILITY DESCRIPTION AND HISTORY

YARL occupies approximately 9.75 ac of land located at 3706 West Nob Hill Boulevard in the City of Yakima, Washington (population 60,000) (Figure 1). The laboratory is affiliated with the U.S. Department of Agriculture (USDA), and develops insect control techniques for fruits and vegetables. Approximately 60 full- and part-time employees work at the facility. Agricultural chemical products are not manufactured on the site. Areas surrounding the site are zoned residential, local small business, and planned development (Figure 2). Three schools, two hospitals, and three shopping centers are located within 0.5 mi of the site. The Yakima Municipal Airport is approximately 1.5 mi south of the site.

Initially, the YARL site was an orchard. Pesticide research began in 1961, and until a few years ago, chemical control studies using pesticides were a major emphasis (approximately 60 percent) of the laboratory's program. A wide variety of pesticide wastes and solvents were discharged to a septic tank and drainfield disposal system at the facility from 1965 to 1985. Prior to 1965, wastes were disposed of directly on the ground (Betz, J., 8 July 1982, personal communication). Because the septic tank and drainfield system allowed pesticides to permeate the soil and because the area is characterized by highly permeable sands and gravels, there is concern that pesticides may be leaching into the shallow drinking water aquifer.

In the past several years, the research emphasis at YARL has changed. Pesticide research is now a minor component (approximately 10 percent) of the research program. Research on systems using natural and biological controls is now emphasized. As part of the research program, pesticide residues are extracted from soil and plant materials by using solvents, including hexane and benzene. Currently, most solvent waste is recycled and

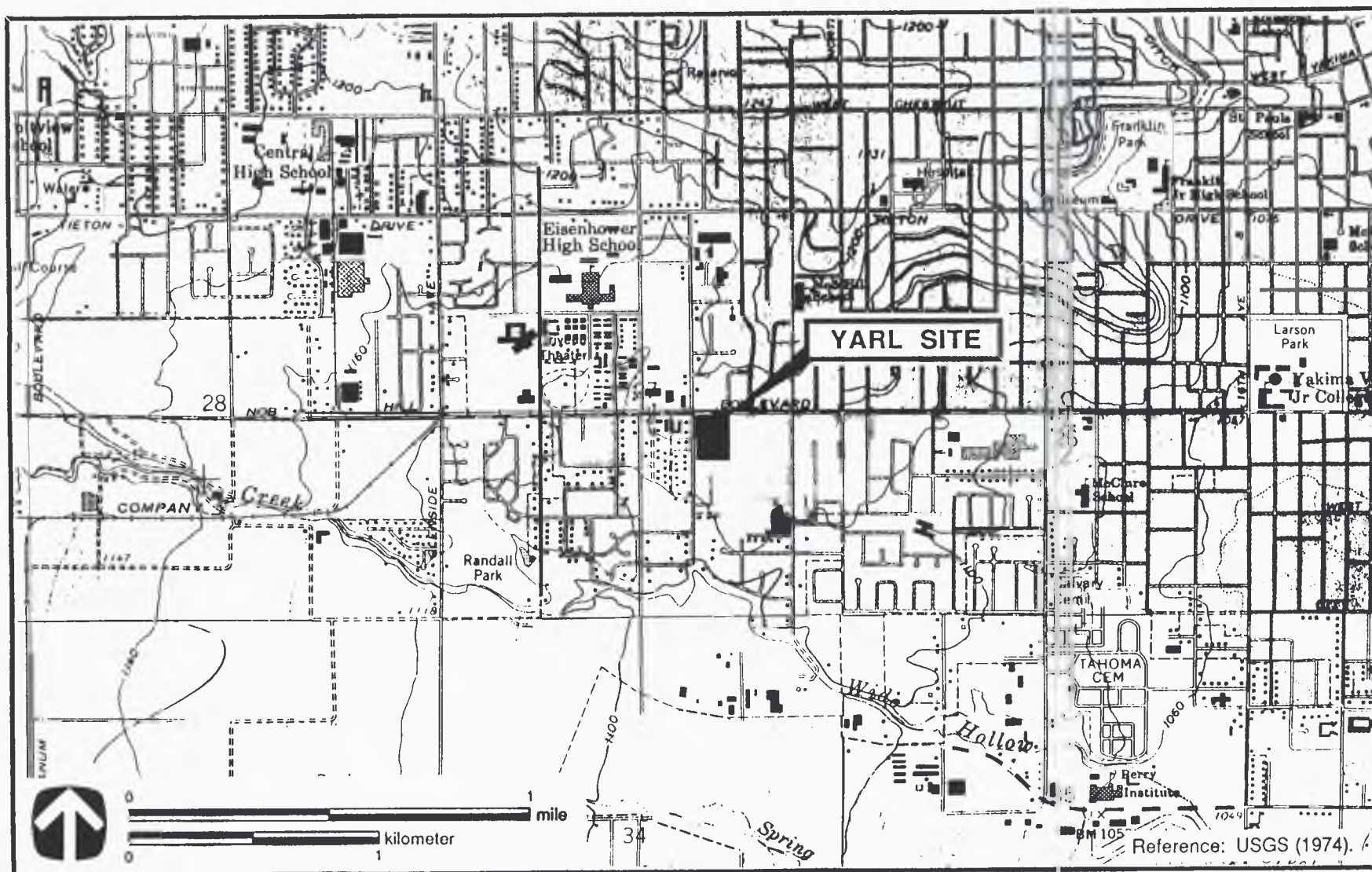


Figure 1. Location map of Yakima Agricultural Research Laboratory (YARL).

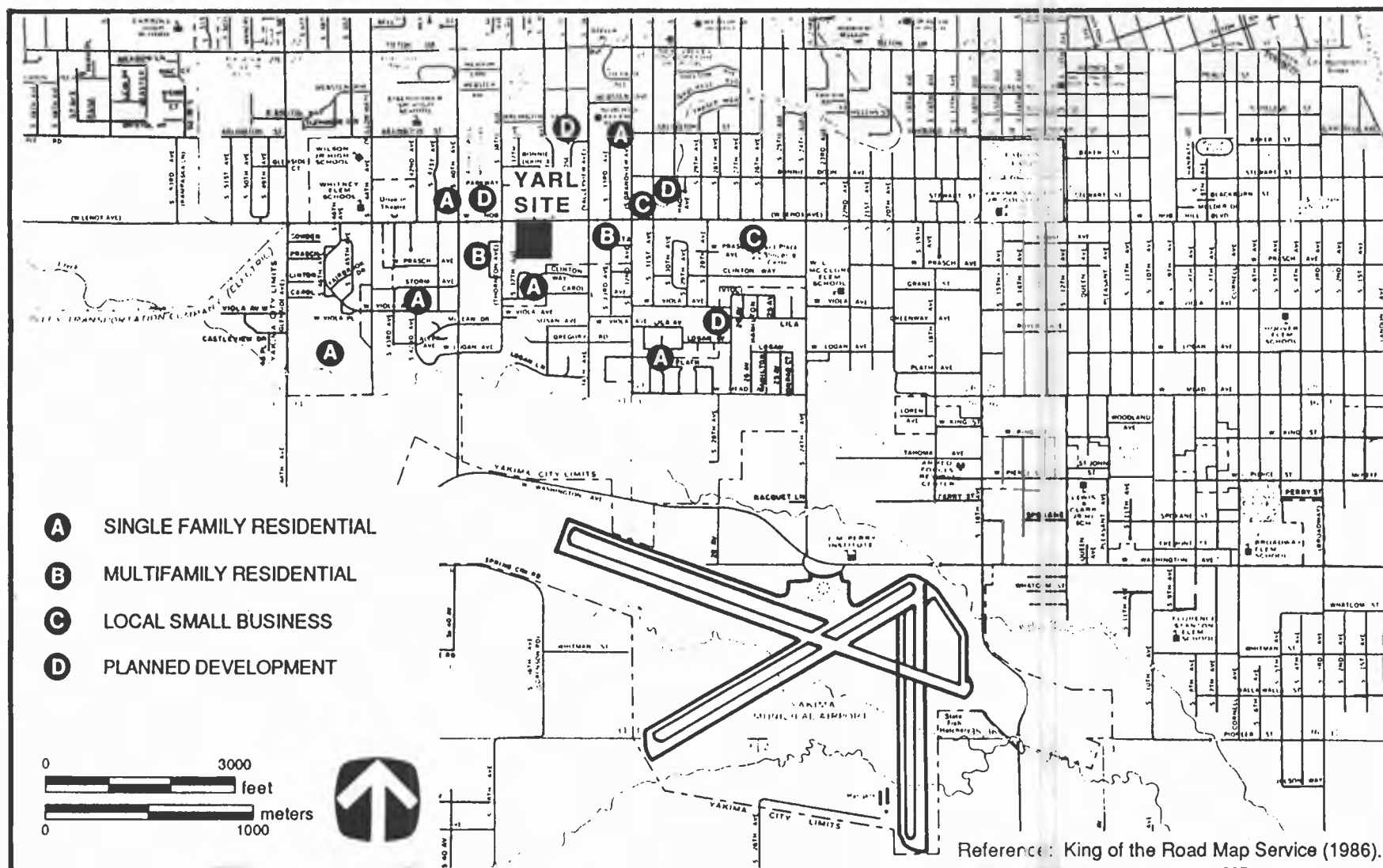


Figure 2. General zoning map of YARL vicinity.

the remaining solvent waste is transported offsite for disposal at a TSD facility. A map of the site is shown in Figure 3.

On 25 January 1985, YARL submitted a closure plan for the septic tank and drainfield system, including a monitoring component to sample and analyze soil and groundwater. Ecology reviewed and approved the plan. The groundwater monitoring system was installed in April 1988. Water quality analysis and water table elevation readings are expected to begin by the end of May 1988 (Comstock, N., 9 May 1988, personal communication). Soil sampling in the drainfield area is expected to begin in June. Core samples and drill cuttings were not analyzed during installation of the groundwater monitoring wells (Baumeister, R., 24 May 1988, personal communication).

2.2 WASTES GENERATED

Wastes generated at the YARL facility consist of a wide variety of pesticide mixtures, rinsates from the cleaning of sprayers and other equipment, and solvents. Until 1981, pesticide concentrate materials were stored onsite as part of active experimental pesticide inventories. The quantity of materials stored is not known. In more recent years, unwanted pesticide concentrate materials and solvent wastes have been shipped offsite to a licensed disposal facility. In 1981, 1982, and 1984, shipments of 1,725, 884, and 1,849 lb, respectively, were sent via a licensed chemical waste hauler to the Chem-Security Systems facility near Arlington, Oregon. Manifests for these shipments are provided in Appendices A-1 (1981), A-2 (1982), and A-3 (1984). Every few years, pesticide stocks in the pesticide storage building (see Photo 3, Appendix E) are inspected and overage, unwanted, or contaminated materials are transported to Arlington. YARL contracts a transporter to drum the pesticides prior to disposal at Arlington. The pesticide storage building is not considered a RCRA-regulated unit because it is used to store pesticide products prior to use. YARL scientists use only the amount of pesticides they need and return the remainder to storage. A sink connected to the drainfield was used to rinse pesticide residues from empty bottles and sprayers. Because all the pesticide in the bottles is used prior to rinsing, the sink is not considered

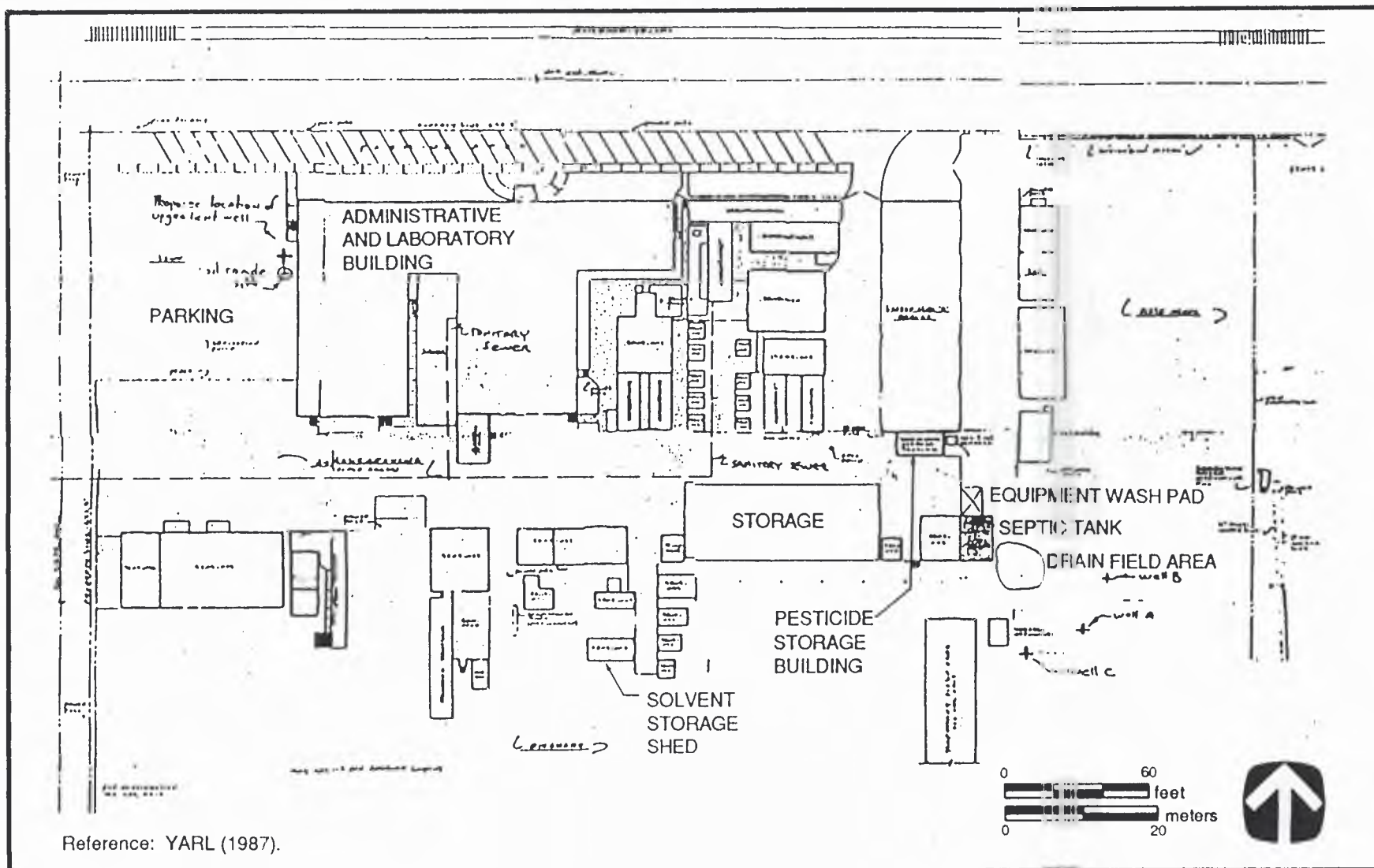


Figure 3. YARL site map.

a waste management unit (RCRA Hotline, 23 May 1988, personal communication).

Today, YARL research scientists request small quantities of pesticides, ordering only the quantity needed. They also seek arrangements to return excess product to the manufacturer. Some surplus pesticides are also given to farmers or used on research plots.

2.3 ENVIRONMENTAL SETTING

2.3.1 Climate

Yakima is located in northeastern Yakima County in south central Washington. The area lies in the rain shadow east of the Cascade Mountains and is characterized by a dry continental climate. The Yakima Valley is generally flat with average elevation above mean sea level of 1,064 ft.

Average annual precipitation in Yakima is approximately 8 in, with a mean annual lake evaporation of 42 in (USDA 1979). Three-quarters of the precipitation occurs between October and March, with December and January being the wettest months. July through September tend to be the driest months.

The mean annual temperature in Yakima is approximately 50° F (USDA 1979). Summers are sunny, warm, and dry. During the warmest summer months, afternoon temperatures in the valley range from the high 80s into the 90s and exceed 100° F at times. In winter, average maximum temperatures are in the 30s and 40s, while minimums range from the teens to the lower 20s.

Winds in Yakima County are predominantly from the west to north (USDA 1979). Strongest winds occur when major storms pass over the area, usually during the fall and winter months.

2.3.2 Geology

The geology of the YARL site consists of Columbia Plateau basalts overlain by alluvial sediments of the Ellensburg Formation. The basalt layer is 250 ft thick and has been folded into a series of large-scale folds. Alluvial gravel, sand, silt, and clay constitute the Ellensburg Formation. This layer is 1,300 ft thick with permeabilities ranging from 5×10^{-3} to 3×10^{-1} cm/sec. These sediments are in turn overlain by approximately 30 ft of recent stream alluvium of the Yakima River and its tributaries. YARL occupies gently sloping ground over a syncline between two hill-forming anticlines (Ahtanum Ridge and Yakima Ridge). The site is a slight topographic high, with adjacent land to the south gradually sloping about 3 percent toward the south [U.S. Geological Survey (USGS) 1974].

Soils at the site are derived from loess and volcanic ash. The 1937-1942 soil survey of the U.S. Soil Conservation Service (SCS 1985) characterizes the YARL site as follows: Ritzville silt loam, 1-8 percent slope, on uplands. The surface soil is pale-brown silt loam about 7 in thick, neutral to mildly alkaline, noncalcareous. The subsoil is pale-brown to light yellowish-brown silt loam or loam about 30 in thick, mildly alkaline, calcareous in the lower part. The soil is not salty or alkaline, has slight erosion hazard due to slow surface runoff, is easy to work, and has moderate inherent fertility. It has medium internal drainage, a moderate to high capacity to hold water, and an indigenous cover of sagebrush and grass. The soil is suited for supporting irrigated orchards, alfalfa production, and pasture.

2.3.3 Hydrogeology

The regional groundwater system in Yakima is generally made up of two aquifers: a shallow aquifer in the alluvial deposits of the Ellensburg Formation and the Yakima River, and a deeper aquifer located in interflow zones of the Columbia basalts. The local hydrogeology of the YARL site is not well known. Water yields in the alluvial deposits are relatively low but adequate for domestic needs (Betz, J., 8 July 1982, personal communication).

The water table is shallow (33 ft), mainly because of extensive irrigation in the area during the summer and influx from creeks draining the mountains (Baumeister, R., 24 May 1988, personal communication). Ecology measured groundwater elevations in the two residential wells ((b) (6) and (b) (6) wells) south of the site at depths of 9.1 and 19.4 ft below the surface. Information specifying which well measured 9.1 ft and which well measured 19.4 ft was not available. Water level fluctuations in the alluvium layer average about 4 ft, due to variations in stream levels, irrigation return flows, precipitation, and evapotranspiration. There is an upward movement of groundwater into the alluvium from underlying aquifers because the shallow aquifer water table is lower than the piezometric surfaces of the lower aquifers (Bechtel Environmental, Inc. 1988). This indicates that confining layers exist to generate upward gradients in the lower aquifer.

The groundwater flow is believed to be toward the south-southeast, although this direction may vary as much as 45° at any given location. This variance may be due to localized subsurface flow to two buried sloughs in the area (i.e., beneath 34th and 38th Avenues). Subsurface water in the two buried sloughs flows towards and terminates at Wide Hollow Creek. A 1985 USGS topographic map shows YARL located 1,146 ft above sea level. The nearest point on Wide Hollow Creek is located 1,100 ft above sea level. It appears that groundwater beneath YARL is generally flowing toward Wide Hollow Creek. There is not enough information to determine if groundwater discharges to Wide Hollow Creek or if the creek discharges to the groundwater. The effect of seasonal influences on groundwater flow direction is unknown.

City Water supplies drinking water to approximately three-quarters of Yakima's residents. The water is pumped from the Naches River, located 2-3 mi north of the YARL site, at a rate of 20 million gal/day. Four backup wells can provide 10 million gal/day of water to the city in the event the main water distribution system is inadequate. Two of these wells are artesian wells, located 1.5 mi southeast of the facility at the Yakima airport and 4 mi northeast of the facility at Kiwanis Park. A "rainy" well

is located 2 mi northwest of the facility near the Naches River. This well collects water through natural infiltration. A deep well, located 4 mi northeast of the facility, provides less than 1 million gal/day (Young, M., 9 May 1988, personal communication).

The Nob Hill Water Association is a private organization that supplies water from deep (500-1,800 ft) wells to approximately one-quarter of Yakima's residents in the western part of the city. These wells are located 2.5-4.5 mi northwest of the facility, at 6111 Tieton Dr., Crest Dr., Bluehills Pl., 8500 Scenic Dr., and 68th and King St. (Shepard, P., 12 December 1987, personal communication).

Water well reports for wells within several miles of the YARL site are included in Appendix B. According to these reports, 12 wells are completed in the shallow aquifer and more than half of those shallow wells are located hydrologically downgradient of the YARL site, in the presumed direction of groundwater flow. At least three shallow domestic wells are less than 1 mi from the site (Figure 4). Water supply wells and their locations are listed in Table 1. However, water well reports were not available from Ecology for the (b) (6) and (b) (6) wells (Bowhay, D., 5 May 1988, personal communication). Groundwater is also used for irrigation purposes in Yakima.

2.3.4 Surface Water

The closest surface water body to the YARL site is the Naches River and Cowiche Ditch, which is located about 500 ft northeast of the site. On a 1985 USGS map, a drainage ditch is located 0.4 mi northeast of the site. There are no other surface drainage ditches within 1 mi of the YARL site on the USGS map. However, Wide Hollow Creek, a perennial creek, is located approximately 0.5 mi south, topographically downgradient of the site, and flows east-southeast to the Yakima River. Wide Hollow Creek is used for bank fishing and domestic irrigation. The Yakima River is located approximately 4 mi east of the site, and the Naches River about 2.5 mi north of the site.

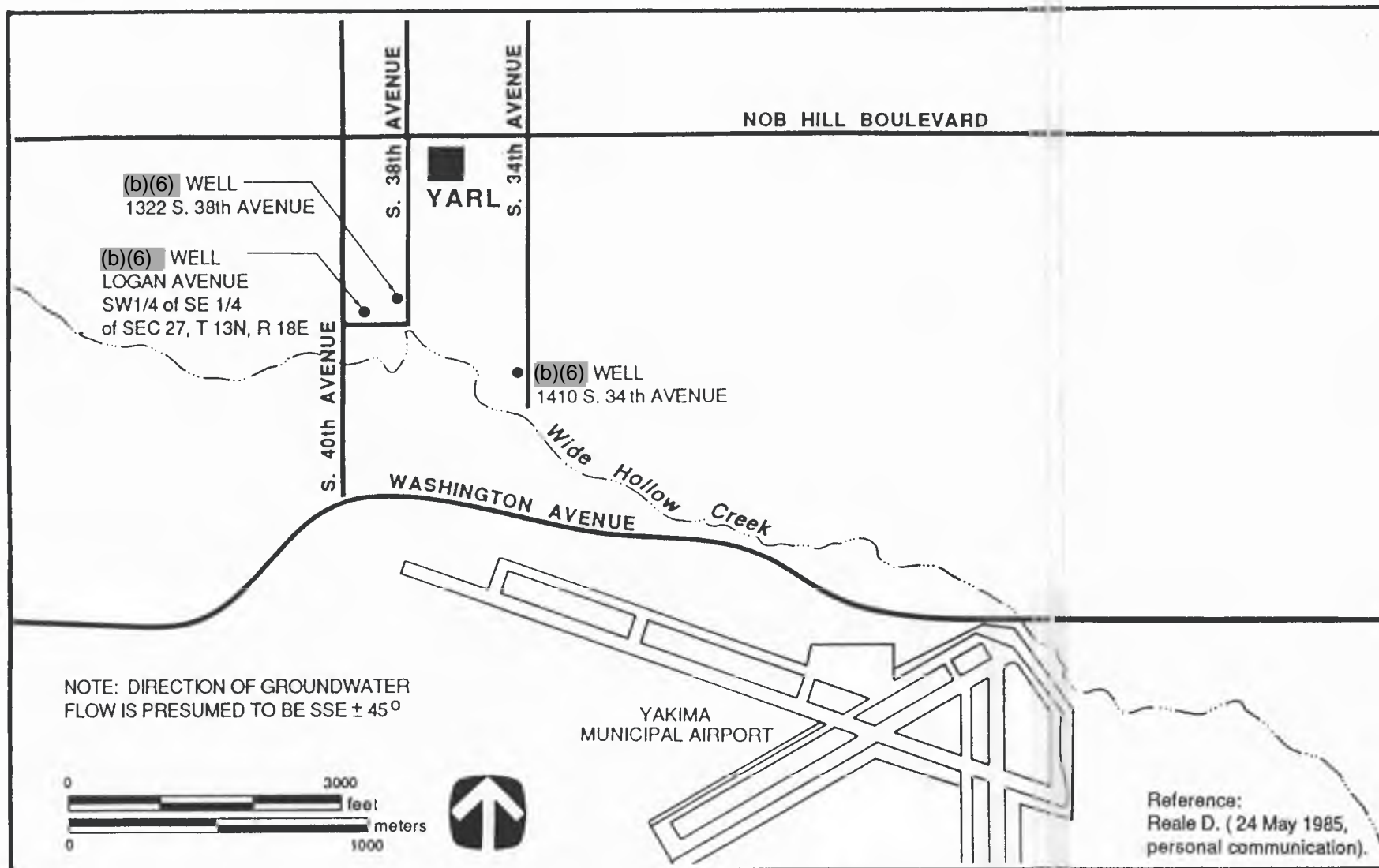


Figure 4. Location of known domestic downgradient wells.

TABLE 1. WATER SUPPLY WELL RECORDS FOR YAKIMA, WA

Owner	Location		Depth (ft)	Aquifer
	Street	Geographic		
(b)(6)		NW SW Sec 34 T13N R16E	350	Deep
		SW SW Sec 34 T13N R18E	106	Deep
		NW SW Sec 34 T13N R18E	95	Deep
		NW SW Sec 34 T13N R18E	49	Shallow
		NW SW Sec 34 T13N R18E	60	Shallow
		NW SW Sec 34 T13N R18E	90	Deep
		NW SW Sec 34 T13N R18E	20	Shallow
		NE SW Sec 34 T13N R18E	21	Shallow
		NE SW Sec 34 T13N R18E	20	Shallow
		NE SW Sec 34 T13N R18E	20	Shallow
		NE SW Sec 34 T13N R18E	118	Deep
		NW SE Sec 34 T13N R18E	751	Deep
		SW NE Sec 34 T13S R18E	92	Deep
		SE NW Sec 34 T13N R18E	75	Shallow
		SW NW Sec 34 T13N R18E	30	Shallow
Packaging Systems, Inc.	--	NW NE Sec 34 T13N R18E	117	Deep
Calvary Cemetery	1405 S. 24th Ave.	SW SE Sec 26 T13N R18E	132	Deep
Calvary Cemetery	1405 S. 24th Ave.	SW SE Sec 26 T13N R18E	190	Deep
(b)(6)		SW SW Sec 26 T13N R18E	57	Shallow
		NE SW Sec 27 T13N R18E	65	Shallow
		NW SW Sec 27 T13N R18E	140	Deep
City of Yakima	129 N. 2nd St.	SW SW Sec 27 T13N R18E	332	Deep
(b)(6)		SW SE Sec 27 T13N R18E	58	Shallow

High stages on the local rivers occur with the melting of the winter snowpack, generally during May and June. Peak flows and flash flooding have occurred along the smaller streams with local heavy rainfall in late fall, early winter, and sometimes spring.

3.0 LOCATION OF RCRA-REGULATED UNITS

The RCRA-regulated units at YARL include the septic tank/drainfield system (Unit 1) and the solvent storage shed (Unit 2). Locations of these units are shown in Figure 3. Descriptions are provided in the following section of this report.

4.0 RELEASE INFORMATION FOR RCRA-REGULATED UNITS

A discussion of each RCRA-regulated unit is provided in this section based on information obtained from the VSI and PR. Groundwater concerns for all RCRA-regulated units in Section 4 of this report will be addressed under the closure and post-closure process.

4.1 UNIT 1. SEPTIC TANK/DRAINFIELD SYSTEM

4.1.1 Description

The septic tank/drainfield system (see Figure 3) was initially designed as a sanitary sewer system. The system was installed in 1961, probably by laboratory personnel (YARL 1987), using the standard plumbing methods of the time. A restroom in a nearby shop and storage building was constructed concurrently with the septic system. The washbasin and toilet of the restroom are linked to the septic tank by drain pipes. Connections were added to modify the system for pesticide disposal. There are no records on file specifying construction of the system.

The septic tank/drainfield system consists of a 300-gal concrete tank connected to a 4-in diameter, 30-ft-long concrete drain tile, installed approximately 2 ft below the ground and covered with topsoil. Overflow effluent from the tank is discharged through the drain tile, which is surrounded by a bed of stream gravel. An inactive buried irrigation line also runs east and west just south of the drainfield tile. This line once provided water for field irrigation from the Naches and Cowiche Ditch. Because the irrigation line apparently leaked, it was plugged in 1985 and replaced with a PVC pipe sprinkler system (Halfhill, J., 8 January 1988, personal communication).

Pesticides in dilute form were first introduced into the septic tank/drainfield system in approximately 1965, when the pesticide storage

building was constructed. The sink installed in this building was connected to the septic tank. Rinse water containing pesticides washed from hand sprayers, glassware, and containers would flow to the septic tank from this sink. In approximately 1974, a 165-ft² concrete pad surrounded by a surface drain was constructed. The surface drain was connected to the septic tank with a 4-in diameter concrete pipe. Field sprayers were drained of excess spray mixtures at the drain. Sprayers, tractors, and other equipment and vehicles were cleaned with a water hose at this site. Surface water runoff from the concrete pad entered the outdoor drain via the 4-in pipeline. The concrete pad is considered part of the septic tank/drainfield system and is not classified as a separate unit (RCRA Hotline, 23 May 1988, personal communication).

The sink in the pesticide storage building was disconnected from the septic tank in June 1984, following a decision by Agricultural Research Service management personnel to close the septic tank/drainfield system. Wastewater and rinsate delivered through the sink drain were collected in portable containers during the 1984 growing season and disposed of by application to overgrown field plots. Workers were instructed not to introduce any more insecticides into the septic tank/drainfield system. The ground drain was sealed with concrete in June 1985 when it became known that equipment washed at the outside drain was contaminated with pesticides. The restroom and washbasin in the shop and storage building remain functional and connected to the septic tank. Although the restroom and washbasin are used infrequently, wastewater is apparently discharged through the drains to the drainfield.

Prior to disconnecting the sink in the pesticide storage building and sealing the ground drain, the facility discharged to the septic tank/drainfield system an estimated 250 gal/yr of various pesticide solutions (5,000 gal over a 20-yr period), containing approximately 100 lb of pesticides, and approximately 5,000 gal/yr of rinsate from the application equipment (YARL 1987).

4.1.2 Waste Characteristics

Research at the laboratory involves the use of registered and experimental pesticides provided by chemical companies. Ecology (1987) estimated that several hundred compounds were disposed of during the 20 yr that the septic tank/drainfield system was in operation. Complete records indicating names and quantities of chemicals disposed of through the septic system do not exist. YARL apparently used a great variety of pesticides in small quantities. Diluted pesticides known to have been introduced into the system with wastewater include but are not limited to Guthion, Sevin, Malathion, Parathion, Tetraethylpyrophosphate (TEPP), DDT, Temik, Methoxychlor, Kelthane, Lindane, Captan, Cyprez, and Benelate (Ecology 1987). Apparently heavy metals, including lead arsenate, and pesticide concentrates were never discharged into the septic tank/drainfield system. The diversity of pesticides used onsite is represented by Table 2, listing names and quantities of pesticides used during the 1986 growing season (Pankanin, J., 20 February 1987, personal communication).

DDT, a persistent chlorinated hydrocarbon, was used by the previous owner, when the site was a pear orchard. DDT was last used in 1967, when a small amount was applied on a plot to determine the depth of migration into the soil. DDT was never discharged to the drainfield. In 1968, USDA discovered that alfalfa grown on YARL land was contaminated with residues of DDT metabolites at levels higher than 100 ug/kg. Chemists at YARL found DDT metabolites at concentrations in excess of 10,000 ug/kg in the upper 12 in of soil from the alfalfa plots (Butler et al. 1970). Results of these DDT residue analyses are shown in Table 3. Recent sampling has shown small amounts of detectable residues of DDT-pp' in the soil (Halfhill 1983).

A brief discussion of the physical and chemical properties of the pesticides used at YARL is provided below.

Organochlorine pesticides have long residence times and low mobility in the soil and exhibit resistance to microbial and chemical degradation. These compounds may persist in the soil for more than 30 yr. The following pesticides are classified as organochlorine:

TABLE 2. PESTICIDES FOR 1986 EXPERIMENTS AND PLOT MAINTENANCE

Advantage (I) ^a	1-2 gal	Noxfire (I)	1 qt
Alar (Plant GR) ^b	1 lb	Omite CR (I)	3 lb
Ammo (I)	1 lb	Orthene (I)	1 lb
Bayleton 50W (F) ^c	4 lb	Orthene (I)	1 lb
Baysir 25W (I)	1 lb	PBU-26 PB-Nox (I)	1 qt
Bay bue 1452 (I)	1 lb	PBU-26 piperonyl butoxide (I)	1 pt
Baytex 4 (I)	1 gal	Parathion (I)	4 lb
Butamin P&O (I)	1 cup (4 oz)	Pentac (I)	1 lb
Bay FCR 1272 (I)	1 pt	Pirimor 50W (I)	1.5 lb
Captan 25 percent SP (F)	11 lb	Pounce (I)	1 qt
Casoron (H)	20 lb	Princep 4L (H) ^d	1 gal
Chlorban granules (I)	1 lb	Pydrin 2.4 EC (I)	3 pt
Cymbush (I)	1 qt	Pyrenone (I)	1 cup (4 oz)
Cyprex 65W (F)	3 lb	Round-up (H)	1.75 gal
Diazinon (I)	4 lb	SBP 1382 (I)	1 pt
Dibrom 8EC (I)	2 gal	Sectrol (I)	24 oz
Dimilin 25W (GR)	10 lb	Spur (I)	1 qt
Disyston (I)	1 gal	Supracide (I)	2 gal
Dursban (I)	3 lb	Supreme oil (I)	50 gal
Furadan 15G (I)	5 lb	Surflan (H)	1 pt
Insectatapes (I)	12 cartons	Tempo 2C	16 oz
MK-936 (I)	1 L	TH 6043 25W (GR)	8 oz
Monitor 4EC (I)	1 pt	TH 6044 25W (GR)	8 oz
Morestan (I)	2 lb	TH 6045 25W (GR)	8 oz
Nicotine sulphate	2 pt	Zolone (I)	1 gal
Nudrin (I)	1 qt		

^a (I) = Insecticide.

^b (F) = Fungicide.

^c (GR) = Granular insecticide.

^d (H) = Herbicide.

Reference: Pankanin, J., 20 February 1987, personal communication.

TABLE 3. RESIDUE ANALYSES OF DDT, TDE, AND DDE
IN ALFALFA, SOIL, AND WASHINGS FROM ALFALFA

Test Number	Parts per billion ^a				
	DDE	Op'-DDT ^b	TDE ^b	Pp'-DDT	Total
In Alfalfa					
September 1967					
Test 1	29.0	21.0		129.0	189.0
Test 2	25.0	20.0		106.0	151.0
Average	32.0	20.5		117.5	170.0
May 1968	9.0	13.0	ND	23.0	45.0
June 1968					
Test 1	21.0	30.0	ND	52.0	103.0
Test 2	21.0	33.0	ND	69.0	123.0
Test 3	22.0	30.0	ND	63.0	115.0
Average	21.3	31.0		61.3	113.6
Washing experiment	In Washed Alfalfa and Washes ^c				
Test 1: alfalfa washed with chloroform	17.0	30.0	ND	54.0	101.0
Test 2: chloroform wash	3.0	4.0	ND	13.0	20.0
	2.0	3.0	ND	10.0	15.0
Average	2.5	3.5		11.5	17.5
Test 3: alfalfa washed with water	17.0	36.0	ND	62.0	115.0
Test 4: water wash	ND	ND	ND	3.0	3.0
	ND	3.0	ND	4.0	7.0
Average	ND	1.5		3.5	5.0
In Soil (May 31, 1968)					
Test 1	2,540	890	ND	4,980	8,410
Test 2	a. 1,900	1,310	ND	5,510	8,720
	b. 2,160	710	ND	3,030	5,900
Average	2,030	1,010	ND	4,270	7,310
Test 3	a. 2,540	1,790	ND	7,510	11,840
	b. 1,850	1,370	ND	5,510	8,730
Average	2,195	1,580	ND	6,510	10,285
Average for all tests	2,198	1,214	ND	5,308	8,720

^aThe residues in alfalfa were corrected for the recovery obtained that year. The residues in soil were not corrected. ND = not detected.

^bThe column used did not separate op'-DDT and TDE sufficiently to measure them separately. The later columns did, and TDE was not detected.

^cOnly one sample of alfalfa from each washing was analyzed for residues.

Reference: Butler et al. (1970).

- DDT
- Lindane
- Methoxychlor
- Captan.

Organophosphate and carbamate pesticides have a short residence time and degrade rapidly. Organophosphates are not persistent, with residence times ranging from 2 wk to several months. Carbamates are slightly to moderately persistent with residence times ranging from 1 to 3 mo. Both organophosphates and carbamates are susceptible to chemical and microbial decomposition and are not transported in the groundwater in measurable quantities. The following pesticides are classified as organophosphates and carbamates:

- Guthion
- Malathion
- Methoxychlor
- Parathion
- TEPP.

The low mobility, low water solubility, and resistance to degradation of organochlorine compounds suggest that they are likely to be contained in the soil beneath the drainfield. Organochlorine compounds have a strong tendency to attach to soil organic and mineral colloids. In comparison, organophosphate and carbamate compounds are dispersed rapidly from the soil due to the susceptibility of these compounds to chemical and microbial decomposition. These compounds are not likely to be detected in the soil at the YARL facility.

4.1.3 Migration Pathways, Evidences of Release, and Exposure Potential

Groundwater is a pathway of concern for contaminant migration. Contaminants released to the subsurface drainfield system may have infiltrated permeable sediments to shallow groundwater. There is potentially a preferred migration route for groundwater (i.e., the north-south sloughs buried under 34th and 38th Avenues). The high potential for evapotranspiration and fine textured layer of soil beneath the drainfield will retard downward groundwater migration.

One water sample was collected from the septic tank during a March 1983 study by the USDA. A control sample was collected along with the water sample. Samples were analyzed for several organophosphate and chlorinated hydrocarbon pesticides by research staff at YARL. The water sample from the septic tank contained no detectable residues (<0.05 mg/kg) of any of the pesticides analyzed (Halfhill 1983). Results of these analyses are presented in Appendix C.

During the USDA 1983 study, Ecology also collected one water sample from the septic tank and sent it to the U.S. EPA Region X laboratory for analysis. Concentrations of Aldrin, Dieldrin, DDT, Endosulfan, and Endrin found in the septic tank exceeded water quality criteria for drinking water consumption (see Table 4 for comparison). Results of these analyses are presented in Appendix D.

Surface water is a potential pathway of concern for contaminant migration. Wide Hollow Creek is located approximately 0.5 mi south of YARL. It is the nearest surface water downgradient from the site in the presumed direction of groundwater flow. Contaminated groundwater flowing toward the south-southeast may release contaminants to Wide Hollow Creek. Wide Hollow Creek flows east-southeast to eventually join the Yakima River. Surface runoff is minimal because the soils are permeable and the gradient is relatively gentle (3 percent).

TABLE 4. ANALYTICAL RESULTS FROM 1983 SOIL SAMPLING (ug/L)

Pesticide	Water Quality Criteria for Protection of Human Health	Measured Value
Aldrin	0	12
Endrin	1	35
Dieldrin	0	11
DDT	0	1,020
Endosulfan	74	280

Reference: U.S. EPA (1987).

Soil is a pathway of concern for contaminant migration. Two soil samples were collected from areas near the septic tank/drainfield system (at depths of 2 ft and 5 ft) on 3 March 1983 by the USDA. Two control samples were also collected, for a total of four samples. The exact locations of these samples was not documented. The samples were analyzed for several organophosphate and chlorinated hydrocarbon pesticides by research staff at YARL. The drainfield soil sample from a 2-ft depth indicated low concentrations of pesticide residues. This soil sample contained organochlorine pesticide residues of 0.05 mg/kg Lindane and 0.10 mg/kg DDT-p,p' (Halfhill 1983). The subsurface soil samples from a 5 ft depth near the drainfield contained no detectable residues (<0.05 mg/kg) of any of the pesticides analyzed (Halfhill 1983). Results of these analyses are presented in Appendix C.

During the USDA 1983 study, Ecology also collected three subsurface soil samples (at depths of 2 ft, 5 ft and 5.5 ft) from the drainfield area. The exact locations of these samples were not documented. These samples were sent to the U.S. EPA Region X laboratory for analysis. Analytical results indicated that the concentration of DDT was 3 mg/kg in one soil sample collected near the drainfield. Results of these analyses are presented in Appendix D.

Air is not a pathway of concern for contaminant migration because contaminants were introduced to the soil 2 ft below the ground surface and will not migrate upwards. Pesticides disposed of in this area are not likely to migrate to the air because of their low volatility. The potential for contaminant migration through the air is extremely low.

Subsurface gas is not a pathway of concern for contaminant migration because the contaminants were introduced in dilute form and not capable of developing subsurface gas in explosive or toxic concentrations.

The potential for human exposure to contaminants associated with the septic tank/drainfield is considered low for all pathways except groundwater. Several residences south of the YARL site obtain drinking water from domestic wells. Because some of these domestic wells are presumed to be

downgradient of the YARL site, there is potential for exposure to of contaminants. The Yakima County Environmental Health Department does not have a file on YARL. There is no record of bacterial contamination of shallow groundwater in the vicinity of YARL (Bohway, D., 5 May 1988, personal communication). A properly functioning septic tank has bacterial-organic mats which chemically absorb pesticide molecules and tend to inhibit rapid movement of pesticides from the drainfield.

Wide Hollow Creek is located approximately 0.5 mi south of the site in the presumed direction of groundwater flow. Because Wide Hollow Creek is used for bank fishing and domestic irrigation, contaminated groundwater discharged into this creek may also affect aquatic biota, irrigated crops, and humans who use these resources.

4.1.4 Conclusions and Recommendations

It is unknown whether groundwater beneath the site is contaminated. The facility's groundwater monitoring wells have not been sampled to date. Nearby domestic wells have not been sampled for pesticides (Anderson, K., 28 July 1987, personal communication). YARL's (1987) soil sampling plan has not been implemented to date. Proposed soil and groundwater sampling locations are shown in Figure 5. The upgradient monitoring well is not shown because its location has not been established.

YARL has not yet characterized the hydrogeology of the site. Groundwater concerns will be handled under the closure and post-closure process. YARL's closure plan outlines monthly groundwater monitoring for water quality, water table elevation, groundwater gradients and flow direction, seasonal fluctuations, and effects of irrigation. A surface and subsurface soil sampling to characterize the nature and extent of soil contamination is also proposed in the closure plan.

If the results from YARL's soil and groundwater investigation indicate contamination, an extensive hydrogeologic assessment should be implemented including installation of additional groundwater monitoring wells, sampling

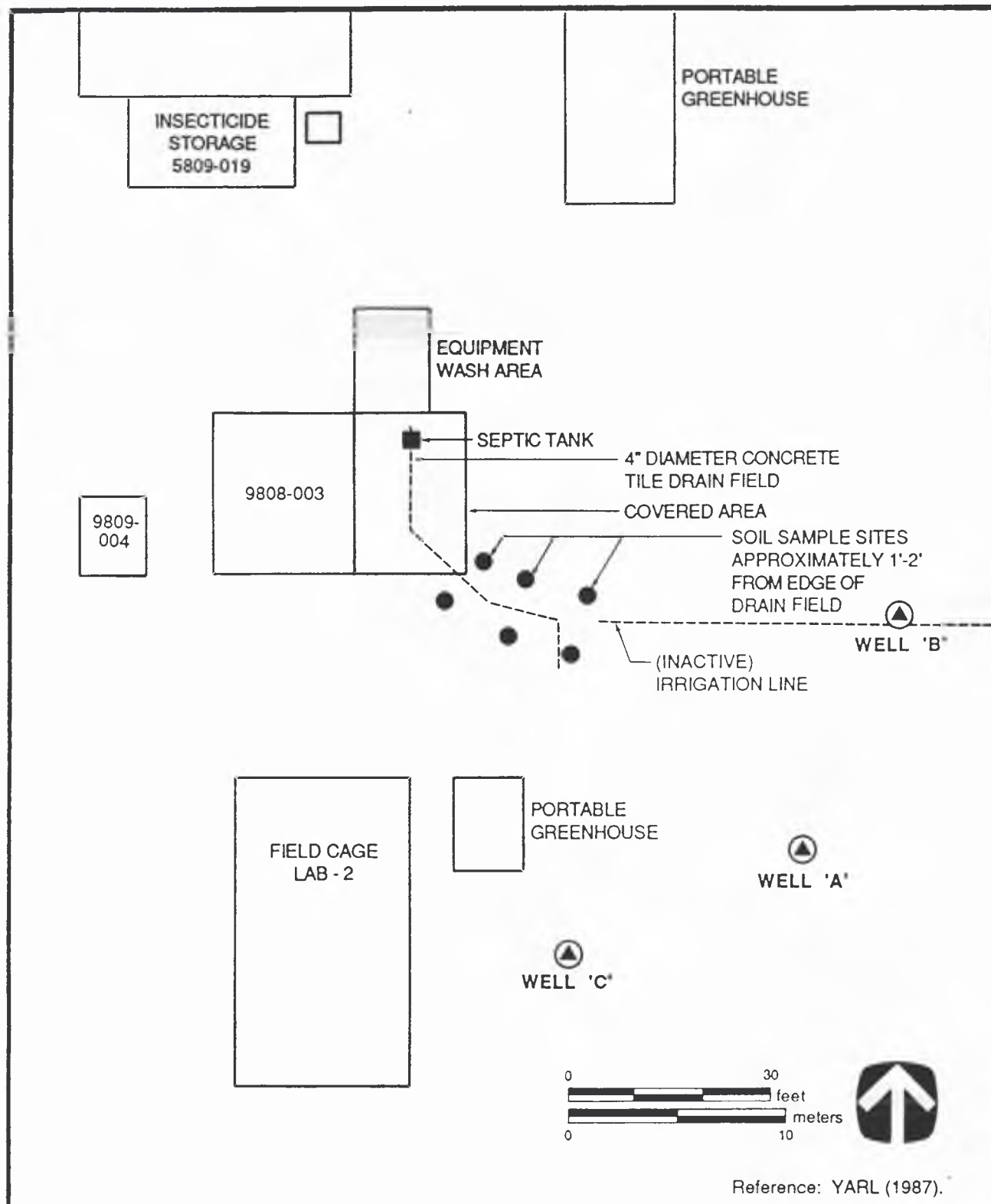


Figure 5. Proposed downgradient soil and groundwater sampling locations.

of downgradient domestic wells, and conduct permeability and shallow aquifer tests.

4.2 UNIT 2. SOLVENT STORAGE SHED

4.2.1 Description

The solvent storage shed, approximately 6 ft x 10 ft with a concrete foundation, is used for storage of both virgin and waste organic solvents (see Figure 3) (Photo 4 of Appendix E). Prior to "a couple of years ago," solvent wastes were sent to the county landfill (Dolphin, R., 9 September 1987, personal communication). Solvent waste is now shipped offsite to a licensed hazardous waste disposal facility (Chem-Security Systems in Arlington, Oregon). YARL generates about 25 gal/yr of solvent waste (Dolphin, R., 9 September 1987, personal communication). During the VSI, there were nine 5-gal drums of solvent waste in the storage shed (see Photo 4 of Appendix E). These wastes have accumulated since the last shipment was made to Chem-Security Systems, approximately 2 yr ago.

4.2.2 Wastes Characteristics

The chemists at YARL test for pesticide residues by using a number of solvents, including hexane and benzene. Wastes generated are actually a mixture of solvents, pesticides, and still bottoms. Solvents used in the chemistry laboratory are redistilled in a laboratory-scale distillation unit. Still bottoms from the distillation process and spent solvent and pesticide mixtures are collected in 5-gal drums. When the 5-gal drum is full, it is sealed and transferred to the solvent storage building. Known components of this solvent mixture, excluding the pesticide component, are described below.

- Benzene is an organic solvent. It is a U.S. EPA listed hazardous waste (F005), a priority pollutant, and known carcinogen.

- Hexane is not listed as a hazardous waste. However, it does have ignitable characteristics (D001).
- Still bottoms are generated from the recovery of spent organic solvents such as benzene. They are a U.S. EPA listed hazardous waste (F005).

4.2.3 Migration Pathways, Evidences of Releases, and Exposure Potential

The potential for contaminant migration from the solvent storage shed to groundwater is low. The shed has a concrete floor, and solvent wastes stored in the shed are sealed in 5-gal drums prior to transfer from the chemistry laboratory.

There is virtually no potential for direct release of wastes in the storage shed to nearby surface water. The surface water nearest to the solvent storage shed are the Naches River and Cowiche Ditch, located approximately 500 ft to the northeast.

There is a potential for the release of solvent waste to soil outside the storage shed if waste drums were spilled in transport to the storage shed. Because drums are sealed prior to transport, the potential for release to soil is low.

Air is not a pathway of concern for contaminant migration. Although many solvents are volatile, the potential for releases to the air is low because drums are sealed and stored in the solvent storage shed.

Subsurface gas is not a pathway of concern for contaminant migration. The potential for subsurface gas development is low because solvent waste are sealed within 5-gal drums and contained in a storage shed with a concrete floor.

The exposure potential to the environment from waste drums stored in the solvent storage shed is low, because of the shed construction design

and the drum sealing practices that are used. The shed has a concrete foundation and is enclosed by a berm.

4.2.4 Conclusions and Recommendations

No further action is required under the RFA/RCRA Facility Investigation process for the solvent storage shed. Mixed solvent, pesticide, and still bottom wastes stored in the solvent storage shed have a low potential for release to the environment. The exposure potential is low because of the drum sealing practices, the construction design of the shed, and the relatively small quantities of waste in storage. No spills were observed during the VSI.

5.0 REFERENCES

Anderson, K. 28 July 1987. Personal Communication (phone by Mr. Brian O'Neal, Tetra Tech, Inc.). Washington Department of Ecology, Environmental Quality Division, Yakima, WA.

Baumeister, R., 24 May 1988. Personal Communication (phone by Ms. Denise M. Jewett, Tetra Tech, Inc.). U.S. Department of Agriculture, Yakima, WA.

Bechtel Environmental, Inc. March 1988. Phase I remedial investigation report for a former pesticide formulation plant. Bechtel Environmental, Inc., Seattle, WA.

Betz, J. 8 July 1982. Personal Communication (internal memorandum to Mr. John Osborn, Ecology and Environment, Inc.) Ecology and Environment, Inc., Seattle, WA.

Bowhay, D. 5 May 1988. Personal Communication (phone by Ms. Denise M. Jewett, Tetra Tech, Inc.). Yakima Agricultural Research Laboratory, Yakima, WA.

Butler, L.I., B.J. Landis, and M.M. McDonough. 1970. Residues of DDT and metabolites in the soil and in alfalfa grown on former orchard land. Washington State University, College of Agriculture, Washington Agricultural Experiment Station, Pullman, WA. 5 pp.

Comstock, N. 9 May 1988. Personal Communication (phone by Ms. Denise M. Jewett, Tetra Tech, Inc.). Yakima Agricultural Research Laboratory, Yakima, WA.

Dolphin, R. 9 September 1987. Personal Communication (meeting with Ms. Susan C. Walker, Tetra Tech, Inc.). Director, Yakima Agricultural Research Laboratory, Yakima, WA.

Halfhill, J.E. 1983. Report of residue analysis, Yakima Agricultural Research Laboratory. Yakima Agricultural Research Laboratory, Yakima, WA. 30 pp.

Halfhill, J.E. 9 September 1987. Personal Communication (meeting with Ms. Susan C. Walker, Tetra Tech, Inc.). Yakima Agricultural Research Laboratory, Yakima, WA.

Halfhill, J.E. 8 January 1988. Personal Communication (phone by Ms. Susan C. Walker, Tetra Tech, Inc.). Yakima Agricultural Research Laboratory, Yakima, WA.

Huntamer, D. 19 April 1983. Personal Communication (letter to Merley McCall, Washington Department of Ecology). Washington Department of Ecology, Yakima, WA.

King of the Road Map Service. 1986. Map of Yakima, Selah, Union Gap. King of the Road Map Service, Inc., Seattle, WA.

Pankanin, J. 20 February 1987. Personal Communication (letter to Mr. C. Rice, Chief, RCRA Compliance Section, U.S. Environmental Protection Agency, Seattle, WA). U.S. EPA, Seattle, WA.

RCRA Hotline. 23 May 1988. Personal Communication (phone by Ms. Denise M. Jewett, Tetra Tech, Inc.). U.S. Environmental Protection Agency, Washington, DC.

Shepard, P. 12 December 1987. Personal Communication (phone by Ms. Susan C. Walker, Tetra Tech, Inc.). Nob Hill Water Association, Yakima, WA.

Sittig, M. 1985. Handbook of toxic and hazardous chemicals, and carcinogens. Second Edition. Noyes Publications, Park Ridge, NJ.

U.S. Department of Agriculture. 1979. Washington climate for Grant, Kittitas, Klickitat, and Yakima Counties. Washington State University, College of Agriculture, Pullman, WA.

U.S. Environmental Protection Agency. 1986. RCRA facility assessment guidance. U.S. EPA, Washington, DC.

U.S. Environmental Protection Agency. 1987. RCRA Facility Investigation (RFI) guidance Vol. I of IV. Development of an RFI work plan and general considerations for RCRA facility investigations. Draft. EPA 350/SW-87-001. U.S. EPA, Waste Management Division, Office of Solid Waste.

U.S. Geological Survey. 1974. Yakima West, WA: national topography map series, Scale 1:24,000. USGS, Reston, VA.

U.S. Soil Conservation Service. 1985. Soil survey of Yakima County area, Washington. U.S. Department of Agriculture, National Cooperative Soil Survey. 345 pp + 87 maps.

Washington Department of Ecology. 1987. Public notice and fact sheets regarding closure plan for Yakima Agricultural Research Laboratory, Yakima, WA. 222 chw and 224 chw. Washington Department of Ecology, Olympia, WA. 4 pp.

Wick, T. 12 December 1987. Personal Communication (phone by Ms. Susan C. Walker, Tetra Tech, Inc.). City Water, Yakima, WA.

Yakima Agricultural Research Laboratory. 1987. Plan amendment and revision of the closure plan for pesticide disposal drainfield at the USDA's Yakima Agricultural Research Laboratory, March 6, 1987. YARL, Yakima, WA. 20 pp. + attachments.

Yakima County Health Department. 5 May 1988. Personal Communication (telephone conversation with Ms. Denise Jewett, Tetra Tech, Inc.). Yakima County Environmental Health Department, Yakima, WA.

Young, M. 9 May 1988. Personal communication (phone by Ms. Denise Jewett, Tetra Tech, Inc.). City of Yakima Water Department, Yakima, WA.

APPENDIX A

HAZARDOUS WASTE MANIFESTS 1981, 1982, AND 1984
AND NOTIFICATION OF HAZARDOUS WASTE ACTIVITY 1980

APPENDIX A-1

HAZARDOUS WASTE MANIFESTS FOR 1981

YAKIMA AGRICULTURAL RESEARCH LABORATORY

ENVIRONMENTAL PROTECTION AGENCY
GENERATOR ANNUAL HAZARDOUS WASTE REPORT

This report is for the calendar year ending December 31, 1981

WAD120513957

10

G

YAKIMA AGRIC RES LAB USDA SEA AR
ATTN: HALFHILL, ERIC RES ENTOM
3706 W NOB HILL BLVD
YAKIMA

WA 98902

I. GENERATOR'S EPA I.D. NUMBER

1 2 13 14 15

II. NAME OF INSTALLATION

30 69

III. INSTALLATION MAILING ADDRESS

15 16 45

Street or P.O. Box

15 16 41 42 47 51

City or Town

State Zip Code

IV. LOCATION OF INSTALLATION (if different than section III above)

15 16 45

Street or Route number

15 16 41 42 47 51

City or Town

State Zip Code

V. INSTALLATION CONTACT

15 16 45

Name (last and first)

51 01 91-51 71 51-51 81 71 71

Phone No. (area code & no.)

VI. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

J. Eric Halfhill, Research Entomologist.

Print/Type Name

Title

Signature of Authorized Representative

Date Signed

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981

VII. GENERATOR'S EPA I.D. NO.

I A C

W I A D 1 1 2 0 5 1 1 3 9 5 7 3 3

1 2

13 14 15

VIII. FACILITY NAME (specify facility to which all wastes on this page were shipped)

CHEM-SECURITY SYSTEMS, INC.

X. FACILITY ADDRESS

Star Route
Arlington, OR 97812

IX. FACILITY'S EPA I.D. NO.

O R D 1 0 8 1 9 4 5 2 3 5 3

16

28

XI. TRANSPORTATION SERVICES USED

(List the name and EPA identification numbers of all transporters whose services were used during 1981. This section to be completed only once. Do not repeat on supplemental sheets.)

Generator transported all wastes

Yakima Agric. Res. Lab. USDA SEA AR/WAD120513957

XII. WASTE IDENTIFICATION

Line #	A. Description of Waste	B. DOT Hazard Code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	Aldicarb	18	P 10 7 1 0	3.71	P
2	Aldoxycarb	18	P 10 6 1 9	3.0	P
3	Azinphosmethyl	18		2.38	P
4	BAY FCR 1272	18		.50	P
5	BAY HOX 3298	18		1.09	P
6	Benomyl	18		.75	P
7	Bufencarb	18		5.00	P
8	Captan	15		5.74	P
9	Carbaryl	13		4.8.55	P
10	Carbofuran	18		1.0.53	P
11	Carbophenothion	18		1.0.50	P
12	CGA	18		8.38	P

XIII. COMMENTS (enter information by section number—see instructions)

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981.

VII. GENERATOR'S EPA I.D. NO.

W A D 1 2 0 5 1 3 9 5 7 3 3
1 2 13 14 15

T.A.C.

VIII. FACILITY NAME (specify facility to which all wastes or this page were shipped)

CHEM-SECURITY SYSTEMS, INC.

IX. FACILITY'S EPA I.D. NO.

O R D 0 8 9 4 5 2 3 5 3
16 28

X. FACILITY ADDRESS

Star Route
Arlington, OR 97812

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification numbers of all transporters whose services were used during 1981. This section to be completed only once. Do not repeat on supplemental sheets.)

XII. WASTE IDENTIFICATION

Line #	A. Description of Waste	B. DOT Hazard Code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	Chlordimeform	18	35 38 39 42	5.00	P
2	Chloropropylate	18		2.38	P
3	Chlorpyrifos	13		1.172	P
4	Cyhexlirin	18		1.50	P
5	DDT	13	10 6 11	1.50	P
6	Diazinon	13		1.349	P
7	Dieldrin	13	P0 3 7	4.18	P
8	Diflubenzuron	13		.25	P
9	Dipel			2.45	P
10	Disulfoton	18	P 0 3 19	6.42	P
11	DS 15647	18		.48	P
12	DS 24465	18		.68	P

XIII. COMMENTS (enter information by section number—see instructions)

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981.

VII. GENERATOR'S EPA I.D. NO.

T/A C

W A I D 1 1 2 0 5 1 3 9 5 7 6 3
1 2 13 14 15

IX. FACILITY'S EPA I.D. NO.

O R D 0 8 9 4 5 2 3 5 3
16 28

VIII. FACILITY NAME (specify facility to which all wastes on this page were shipped)

CHEM-SECURITY SYSTEMS, INC.

X. FACILITY ADDRESS

Star Route
Arlington, OR 97812

XI. TRANSPORTATION SERVICES USED

(List the name and EPA identification numbers of all transportation services used during 1981. This section to be completed only once. Do not repeat on supplemental sheets.)

XII. WASTE IDENTIFICATION

Line	A. Description of Waste	B. DOT Hazard Code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	Endosulfan	1,8	0510	3,76	P
2	Ethiofencarb	1,8		2,00	P
3	Ethion	1,8		7,37	P
4	Ethoprop	1,8		1,838	P
5	Fenitrothion	1,8		,60	P
6	Fensulfothion	1,8		4,984	P
7	Fenthion	1,8		1,00	P
8	Fenvalerate	1,8		5,48	P
9	FMC 27289	1,8		,76	P
10	FMC 35001	1,8		,75	P
11	FMC 45498	1,8		,01	P
12	Fonofos	1,8		4,45	P

XIII. COMMENTS (enter information by section number—see instructions)

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981.

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

T/A C

G W A D 1 2 0 5 1 3 9 5 7 1 1
1 2 13 14 15

VIII. FACILITY NAME (Specify facility to which all wastes on this page were shipped)

CHEM-SECURITY, INC.

X. FACILITY ADDRESS

Star Route

Arlington, OR 97812

IX. FACILITY'S EPA I.D. NO.

F O R D 0 8 9 4 5 2 3 5 3
16 28

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification numbers of all transporters whose services were used during 1981. This section to be completed only once. Do not repeat on supplemental sheets.)

XII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard Code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	1	Formetanate hydrochloride	18	35 38 39 42	2.76	P
2	2	GCP 3937	13		.50	P
3	3	GCP 6361	13		.35	P
4	4	Isofenphos	18		1 3.28	P
5	5	M 3016	18		.75	P
6	6	M 4170	18		.38	P
7	7	M 4365	18		.75	P
8	8	Maneb-zinc			1 .75	P
9	9	Methamidophos	18		7 5.63	P
10	10	Methiocarb	18		.04	P
11	11	Methomyl	18		1.80	P
12	12	Methoxychlor	15	D 0 1 4 U 2 4 7	1 6 .88	P

XIII. COMMENTS (enter information by section number—see instructions)

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981.

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

T/A C

G W A D 1 2 0 5 1 3 9 5 7 1 1
1 2 13 14 15

VIII. FACILITY NAME (Specify facility to which all wastes on this page were shipped)

CHEM-SECURITY SYSTEMS, INC.

X. FACILITY ADDRESS

Star Route
Arlington, OR 97812

IX. FACILITY'S EPA I.D. NO.

F O R D 0 8 9 4 5 2 3 5 3
16 28

XI. TRANSPORTATION SERVICES USED

(List the name and EPA identification numbers of all transporters whose services were used during 1981. This section to be completed only once. Do not repeat on supplemental sheets.)

XII. WASTE IDENTIFICATION

Sequence	Line	A. Description of Waste	B. DOT Hazard Code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	1	Monocrotophos	1,8	35 38 39 42 33 34 43 46 47 50 51	11010	P
2	2	Naled	1,8		1216125	P
3	3	NC 6897	1,8		1816	P
4	4	Oxydemeton-methyl	1,8		141613	P
5	5	Oxythioquinox	1,3		0,5	P
6	6	PCNB	1,8	1111815	1,2,5,0	P
7	7	Permethrin	1,8		1,4,8	P
8	8	Phorate	1,8	P101914	1,5,5,1	P
9	9	Phosphamidon	1,8		712,5	P
10	10	Pirimicarb	1,8		2,7,6	P
11	11	Propargite	1,5		131618	P
12	12	Propoxur	1,8		0,4	P

XIII. COMMENTS (enter information by section number—see instructions)

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981.

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

T/A C

G I W A I D I I 1 2 1 0 1 5 1 1 3 9 1 5 7 1 1 1

1 2 13 14 15

IX. FACILITY'S EPA I.D. NO.

F I O R I D I 0 8 9 4 5 2 3 5 3

16 28

VIII. FACILITY NAME (Specify facility to which all wastes on this page were shipped)

CHEM-SECURITY SYSTEMS, INC.

X. FACILITY ADDRESS

Star Route

Arlington, OR 97812

XI. TRANSPORTATION SERVICES USED (Enter the name and EPA identification number of all transporters whose services were used during 1981. This section is to be completed only if you do not report an supplemental shipment.)

XII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard Code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	1	RE 26744	1 8 35	38 39 42	1 75	P
2	2	Rotenone	1 8 43	46 47 50 51	1 04	P
3	3	SAN 65381	1 3		1 63	P
4	4	SD 9129-Monocrotophos	1 8		7 81	P
5	5	SD 14114-Hexakis	1 8		1 12	P
6	6	Sodium cyanide	1 8	P 1 1 0 1 6	4 9 00	P
7	7	Sodium hydroxide	0 2		2 8 86	P
8	8	Sprint 38	1 8		1 76	P
9	9	Strychnine	1 8	P 1 1 0 1 8	1 05	P
10	10	Sulfur ORM-C	1		1 3 50	P
11	11	TEPP	1 8	P 1 1 1 1 1	1 50	P
12	12	Terbufos	1 8		1 7 55	P

XIII. COMMENTS (enter information by section number—see instructions)

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981.

Date rec'd: _____

Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

G W A D 1 2 0 5 1 3 9 5 7 1 1
1 2 13 14 15

T/A C

IX. FACILITY'S EPA I.D. NO.

F 0 R D 0 1 8 1 9 1 4 5 1 2 3 5 3
16 28

VIII. FACILITY NAME (Specify facility to which all wastes on this page were shipped)

CHEM-SECURITY SYSTEMS, INC.

X. FACILITY ADDRESS

Star Route
Arlington, OR 97812

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification numbers of all transporters whose services were used. Do not repeat on transportation sheets.)

XII. WASTE IDENTIFICATION

Sequence #	A. Description of Waste	B. DOT Hazard Code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	Thiodicarb	1,8	35 38 39 42	13.63	P
2	Thiofanox	1,8	P 10 14 15	2.81	P
3	Toxaphene	1,3	U 12 12 14 D 10 11 15 P 1 1 2 13	1.350	P
4	Trichlorfon	1,3		3.50	P
5	UBI 439-1265	1,8		1.25	P
6	UBI R-677	1,8		1.50	P
7	Zinc phosphide	1,8	P 11 12 12	1.50	P
8	ZR 856	1,3		1.40	P
9					
10					
11					
12					

XIII. COMMENTS (enter information by section number—see instructions)

APPENDIX A-2

HAZARDOUS WASTE MANIFESTS FOR 1982

YAKIMA AGRICULTURAL RESEARCH LABORATORY

TRANSPORTATION COMPANY		ROUTE ORDER/RELEASE NO.													
TENDERED TO STOP	HS CAR OR TRUCK AT	<table border="1"> <tr> <th colspan="2">CAR-TRUCK-CONTAINER (Length/Cube)</th> <th colspan="2">MARKED CAPACITY †</th> <th>DATE FURNISHED †</th> <th>DATE B/L ISSUED</th> </tr> <tr> <th>ORDERED</th> <th>FURNISHED</th> <th>ORDERED</th> <th>FURNISHED</th> <td></td> <td>10/18/52</td> </tr> </table>		CAR-TRUCK-CONTAINER (Length/Cube)		MARKED CAPACITY †		DATE FURNISHED †	DATE B/L ISSUED	ORDERED	FURNISHED	ORDERED	FURNISHED		10/18/52
CAR-TRUCK-CONTAINER (Length/Cube)		MARKED CAPACITY †		DATE FURNISHED †	DATE B/L ISSUED										
ORDERED	FURNISHED	ORDERED	FURNISHED		10/18/52										
FOR CAR, TRUCK OR CONTAINER INITIALS AND NO.		IMPORTANT Issuing office to send this copy to consignee immediately after surrender of original to initial carrier.													
RECEIVED BY THE TRANSPORTATION COMPANY NAMED ABOVE, SUBJECT TO CONDITIONS NAMED ON THE REVERSE OF THE ORIGINAL BILL OF LADING, THE PROPERTY HEREINAFTER DESCRIBED, IN APPARENT GOOD ORDER AND CONDITION (CONTENTS AND VALUE UNKNOWN), TO BE FORWARDED TO DESTINATION BY THE SAID COMPANY AND CONNECTING LINES, THERE TO BE DELIVERED IN LIKE GOOD ORDER AND CONDITION TO SAID CONSIGNEE.		FROM <u>Yakima, Washington</u> (Shipping point) → <u>3706 W. Hob Hill Boulevard</u> FULL NAME OF SHIPPER <u>USDA/Agricultural Research Service</u> <u>3706 W. Hob Hill Boulevard/Yakima, WA 98902</u>													
CONSIGNEE (Name, address and ZIP code) <u>Chem-Security Systems, Inc.</u> <u>Star Route</u> <u>Arlington, Oregon 97812</u>		MARKS CHARGES TO BE BILLED TO DEPARTMENT OR AGENCY <u>U. S. Department of Agriculture</u> BUREAU OR OFFICE <u>National Finance Center</u> <u>P. O. Box 60000 New Orleans, LA 70160</u>													
DESTINATION (Name of installation) <u>Chem-Security Systems, Inc. - approximately</u> <u>7 miles beyond Arlington on the Condon Highway</u> (Street address) (City) (State or country) (ZIP code)		APPROPRIATION CHARGEABLE <u>301-5905-20224 8156</u>													
SEAL NOS.		FOR CARRIER'S USE ONLY WAYBILL NO. OR FREIGHT B/L NO.													
APPLIED BY:		CONTRACTORS WILL RETURN UNUSED OR CANCELED BILLS OF LADING TO GOVERNMENT OFFICE FROM WHICH RECEIVED.													

PACKAGES		DESCRIPTION OF ARTICLES (Use carrier's classification or tariff description if possible; otherwise use a clear nontechnical description)	NUMBERS ON PACKAGES	WEIGHTS*
NO.	KIND			
6	DRUM	Mixed pesticides*(insecticides & herbicides)	24366 24367 24368 24369 24370 35499	35 lbs each
IF THIS SHIPMENT FULLY LOADS THE CAR OR TRUCK USED, CHECK <input type="checkbox"/> YES				

Estimated
~~8600~~
 8 75 + 5
 T
 3566

TARIFF OR SPECIAL RATE AUTHORITIES (CL, TL, or Vol only)

CARRIER FURNISHED <input type="checkbox"/> PICKUP SERVICE AT ORIGIN <input type="checkbox"/> TRAP-CAR INITIALS OF SHIPPER'S AGENT _____		B/L NO. <u>L-0798156</u>	FOR USE OF ISSUING OFFICE CONTRACT OR PURCHASE ORDER NO. OR OTHER AUTHORITY _____ DATED _____	
NAME OF TRANSPORTATION COMPANY → <u>Silver Wheels</u>		F.O.B. POINT NAMED <u>Yakima, WA</u>		
DATE OF RECEIPT OF SHIPMENT _____		NAME OF ISSUING OFFICER <u>J. BROOKS BROWN</u>		
INITIAL CARRIER'S AGENT, BY SIGNATURE BELOW, CERTIFIES HE RECEIVED THE ORIGINAL BILL OF LADING.		DATE <u>10/16/52</u> TITLE <u>Administrative Officer</u>		
SIGNATURE OF AGENT _____		ISSUING OFFICE <u>USDA/ARS</u> <u>3705 W. Hob Hill Blvd, Yakima, WA 98902</u> (Street address) (City) (State or country) (ZIP code)		

MEMORANDUM COPY—CONSIGNEE

THIS CONSIGNMENT DELIVERED COMPLETE AND IN APPARENT GOOD ORDER EXCEPT AS MAY BE INDICATED HEREFTER.

☐ SHORTAGE☐ DAMAGE☐ CARRIER OS&D REPORT ATTACHED.CARRIER FURNISHED ☐ DELIVERY ☐ TRAP-CAR SERVICE AT DESTINATION.



Department of Environmental Quality

522 SOUTHWEST 5TH AVE. PORTLAND, OREGON

MAILING ADDRESS: P.O. BOX 1760, PORTLAND, OREGON 97207

VAD 120513957

June 3, 1982

Ms. A. Jeanne Van Wallendael
Chem-Security Systems, Inc.
P.O. Box 1866
Bellevue, WA 98009

Re: HW File 4.10 T

Dear Ms. Van Wallendael:

We have reviewed Disposal Request No. 1118.1, submitted with your May 26, 1982 letter.

WASTE SOURCE

Yakima Agricultural Research Laboratories
USDA SEA AR
3706 W. Nob Hill Blvd.
Yakima, WA 98902

MATERIAL(S) REQUESTED FOR DISPOSAL

<u>Description</u>	<u>Hazard Type</u>	<u>Process/Operation Generating Waste</u>	<u>Quantity For Disposal</u>	
			<u>Now</u>	<u>Annual</u>
Small quantities of various pesticides (see attached list)	Toxic (T _x)	Pesticide evaluation research.	-	8 drums

MATERIAL(S) AUTHORIZED FOR DISPOSAL

Same as above.

METHOD OF DISPOSAL

Trench 10, Procedure 4.

Sincerely,

Eduardo G. Chiong
Eduardo G. Chiong, Engineer
Hazardous Waste Section
Solid Waste Division

EGC:b
ZB1030

Enclosure

cc: Frank Dement, Chem-Security Systems, Inc., Arlington, OR
Mr. J. Brooks Brown, Yakima Agricultural Research Laboratories



EPA ID NO. ORD 08 945 2353

ARLINGTON (503) 454-2777

BELLEVUE (206) 827-0711

PORTLAND (503) 223-1912

VANCOUVER, B.C. (604) 669-2204

1 BUSINESS INFORMATION - INFORMATION TO BE COMPLETED BY THE GENERATOR

A. Generator Name Yakima Agric. Res. Lab. USDA SEA AR B. EPA ID NO. WAD120513957
C. Facility Address 3706 W Nob Hill Blvd Billing Address National Finance Center
Yakima, WA 98902 P. O. Box 60075
New Orleans, LA 70160
D. Business Contact J. Brooks Brown Title Admin. Asst Phone (509) 575-5977/5877
E. Technical Contact Dr. J. Eric Halfhill Title Research Entomologist Phone (509) 575-5982/5877

2 WASTE DESCRIPTION

A. Generator's common name for this waste product: Mixed pesticides (Insecticides & Herbicides)
If PCB please complete: ☐ >500 ppm ☐ 500 ppm ☒ <50 ppm ☐ <50 ppm
B. Process generating waste: Pesticide evaluation research (Is not a production process)
C. Estimated Annual Quantity 1000 lb/8 55-gallon drums Unit of Measure _____
D. Properties (Complete As Required)
1. Physical State at 70° F: ☒ Powder ☐ Solid ☐ Liquid ☐ Sludge
2. Density (as weight/unit) _____
3. Solids. ☐ By Weight ☐ By Volume
Total _____ % Dissolved _____ % Suspended _____ %
4. pH (indicate range) _____
5. Viscosity _____
6. Phases or Layers (for liquids only)
☐ One ☐ Two ☒ Multiple
Top _____ % Others _____ %
Bottom _____ %
7. Flash Point _____ °F ☐ Closed Cup ☐ Open Cup Specify _____
8. Sulfur: ☐ 0-Trace ☐ <1% ☐ >1% Specify _____
9. Organo-Chlorine: ☐ 0-Trace ☐ <1% ☐ >1% Specify _____
E. Waste Composition - Account for 100%. See attached lists
Indicate PPM, or % as appropriate for each constituent; use N/A if not applicable.

	RANGE		RANGE	ORGANICS (SPECIFY)	RANGE	CHARACTERISTIC COLOR	
Water	-	Ag	-		-		
HCl	-	As	-		-		
HF	-	Ba	-		-	DISTINCTIVE ODOR	
H ₂ SO ₄	-	Cd	-		-		
HNO ₃	-	Cr	-		-		
H ₃ PO ₄	-	Cu	-	PESTICIDES (SPECIFY)	RANGE	OTHER CONSTITUENT	RANGE
NaOH	-	Hg	-	Dioxin (ppb)	-		-
Ca (OH) ₂	-	F	-	2,4-D	-		-
NH ₄ OH	-	Pb	-	2,4,5-T	-		-
Cyanide	-	Se	-		-		-
CaCO ₃	-	Zn	-		-		-

Does this waste stream contain any radioactive, reactive, water reactive, pyrophoric or shock sensitive materials? NO
If yes, explain _____

(Attach additional explanation if necessary)

F. Is this waste a "hazardous waste" as defined by regulations of the U.S. Environmental Protection Agency of the Resource Conservation and Recovery Act? YES

(See CFR 40 Part 261) If so, please list hazardous waste number that applies to the description: See attached list

G. Is this waste a regulated waste in your State, Province, or Locality? Yes. If so state why it is so defined and any waste code that apply. See attached lists

H. Is this waste a "hazardous material" as defined by regulations of the U.S. Department of Transportation pursuant to the Hazardous Materials Transportation Act? Yes

(See 49 CFR 172.101 and 173 for "Hazardous Materials" list and characteristics)

If so, please advise of the following:

a. Proper shipping name: See attached lists

b. DOT container(s): 17 SC

c. Hazard class: A combination of "Flammable Liquids, Poison B, Corrosives, ORM-A and ORM-E."

d. Identification number (from "DOT Hazardous Materials Table"): See attached lists

3 SHIPPING REQUIREMENTS

A. Indicate how this waste material is to be shipped:

☒ Drum ☐ Tanker ☐ Other

Size of Container(s) 55-gallons

B. Shipping frequency:

Quantity 8 Per year (one time)

C. Transportation equipment requirements (e.g. for bulk liquids state required tanker specifications)

D. Service & scheduling special instructions:

E. Service & Scheduling Contact: Telephone

4 CERTIFICATION

I hereby certify that I have personally examined and am familiar with the information submitted in this document. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete to the best of my knowledge and ability and that all known and suspected hazards have been disclosed.

4/30/82

Date

Research Entomologist

Title

Eric H. H. H.
Signature

5 THIS SECTION IS FOR CSSI SITE OPERATIONS

A. Regulatory ☐ Notification ☐ Supplemental request

B. Proposed Disposal Method:

1. Primary Six Digit Code

2. Alternative Six Digit Code

6 THIS SECTION FOR REGULATORY APPROVAL

A. Primary Proposed Method Approved ☐ Not Approved ☐

D. Approved By:

B. Alternate Proposed Method Approved ☐ Not Approved ☐

Title Date

C. Comments



STAR ROUTE, ARLINGTON, OR. 97812

CHEMICAL TRANSPORTATION MANIFEST

ID. NO. OR 03 945 2353

24366

ARLINGTON (503) 454-2777

PORTLAND (503) 223-1912

BELLEVUE (206) 827-0711

VANCOUVER, B.C. (604) 688-7612

GENERATOR Yakima Agric. Res. Lab., USDA ARSID. NO. WAD 12 051 3957ADDRESS 3706 W Nob Hill Blvd, Yakima, WA 98902PHONE (509) 575 5877

WASTE DESCRIPTION	CONTAINER		GAL.	LB.	FT.
	QUANTITY	TYPE			
See List Attached To This Form	01	Drum	55	98	7.36

DOT SHIPPING NAME Herbicides-Dr. NOSDOT HAZARD CLASS Poison B

PHYSICAL STATE (circle)

SOLID

LIQUID

SLUDGE

OTHER

MAJOR HAZARD (circle)

TOXIC

CORROSIVE

IGNITABLE

REACTIVE

OTHER

SPECIAL INSTRUCTIONS (HANDLING/EMERGENCY)

IN THE EVENT OF A SPILL, CONTACT EITHER OF THE CHEM-SECURITY SYSTEMS OFFICES
AND/OR CONTACT, IN THE UNITED STATES, THE NATIONAL RESPONSE CENTER, U.S. COAST
GUARD (800) 424-8802, OR CONTACT, IN CANADA, TRANSPORT CANADA (613) 996-6666
FOR EMERGENCY ASSISTANCE.

Title to all materials furnished for disposal herein shall be deemed to be vested in Chem-Security Systems, Inc., immediately upon acceptance of such materials by Chem-Security Systems, Inc., from the generator or transporter. The generator shall have no right to recovery nor any credit for the potential value of any substances contained in such materials furnished for disposal, except as separately agreed in writing by Chem-Security Systems, Inc. Disposal operations by Chem-Security Systems, Inc., will be in accordance with procedures approved by the Oregon Department of Environmental Quality and the United States Environmental Protection Agency.

This is to certify that the above-named materials are properly classified, described, packaged, marked, labeled and are in proper condition for transportation according to the applicable regulations of the U.S. Department of Transportation and the U.S. Environmental Protection Agency. Signed and dated by the authorized agent of the generator:

GENERATOR SIGNATURE

DATE

TRANSPORTER

ID. NO.

ADDRESS

PHONE

TRANSPORTER SIGNATURE

DATE

TREATMENT FACILITY OR
COLLECTION SITE

ID. NO.

ADDRESS

PHONE

SIGNATURE

DATE

ALTERNATE
TRANSPORTER NO. 1

ID. NO.

ADDRESS

PHONE

TRANSPORTER SIGNATURE

DATE

ALTERNATE
TRANSPORTER NO. 2

ID. NO.

ADDRESS

PHONE

TRANSPORTER SIGNATURE

DATE

ALTERNATE FACILITY

ID. NO.

ADDRESS

CSSI

REQ. NO.

BILL OF LADING NO.

WEIGHT TICKET NO.

GROSS

Manifest 24366

Chemical	Formulation	Hazard Class	ID#	EPA#	RQ=	Comments	Net Weight	Gross Weight
Chlorbromuron	50W						5.0	10.0
Cyanazine	80W						14.4	18.0
Metobromuron	50W						18.0	36.0
Procyazine	80W						15.2	19.0
Secbumeton	80W						12.0	15.0
							<hr/> 64.6	<hr/> 98.0

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.



ID. NO. ORD 08 945 2353
ARLINGTON (503) 454-2777
BELLEVUE (206) 827-0711

PORTLAND (503) 223-1912
VANCOUVER, B.C. (604) 688-7612

24367

GENERATOR Yakima Agric. Res. Lab., USDA/ARS ID. NO. WAD 12 051 3957
ADDRESS 3706 W Nob Hill Blvd, Yakima, WA 98902 PHONE (509) 575 5877

WASTE DESCRIPTION	CONTAINER		GAL.	LB.	FT.
	QUANTITY	TYPE			
See List Attached To This Form	01	Drum	55	160.6	7.36

DOT SHIPPING NAME Herbicides-Dry&Liquid, NCS DOT HAZARD CLASS Poison B
PHYSICAL STATE (circle) SOLID LIQUID SLUDGE OTHER _____
MAJOR HAZARD (circle) TOXIC CORROSIVE IGNITABLE REACTIVE OTHER _____
SPECIAL INSTRUCTIONS (HANDLING/EMERGENCY) _____

**IN THE EVENT OF A SPILL, CONTACT EITHER OF THE CHEM-SECURITY SYSTEMS OFFICES
AND/OR CONTACT, IN THE UNITED STATES, THE NATIONAL RESPONSE CENTER, U.S. COAST
GUARD (800) 424-8802, OR CONTACT, IN CANADA, TRANSPORT CANADA (613) 996-6666
FOR EMERGENCY ASSISTANCE.**

Title to all materials furnished for disposal herein shall be deemed to be vested in Chem-Security Systems, Inc., immediately upon acceptance of such materials by Chem-Security Systems, Inc., from the generator or transporter. The generator shall have no right to recovery nor any credit for the potential value of any substances contained in such materials furnished for disposal, except as separately agreed in writing by Chem-Security Systems, Inc. Disposal operations by Chem-Security Systems, Inc., will be in accordance with procedures approved by the Oregon Department of Environmental Quality and the United States Environmental Protection Agency.

This is to certify that the above-named materials are properly classified, described, packaged, marked, labeled and are in proper condition for transportation according to the applicable regulations of the U.S. Department of Transportation and the U.S. Environmental Protection Agency. Signed and dated by the authorized agent of the generator:

GENERATOR SIGNATURE _____ DATE 15 October 1991
TRANSPORTER _____ ID. NO. _____
ADDRESS _____ PHONE _____
TRANSPORTER SIGNATURE _____ DATE _____
TREATMENT FACILITY OR COLLECTION SITE _____ ID. NO. _____
ADDRESS _____ PHONE _____
SIGNATURE _____ DATE _____
ALTERNATE TRANSPORTER NO. 1 _____ ID. NO. _____
ADDRESS _____ PHONE _____
TRANSPORTER SIGNATURE _____ DATE _____
ALTERNATE TRANSPORTER NO. 2 _____ ID. NO. _____
ADDRESS _____ PHONE _____
TRANSPORTER SIGNATURE _____ DATE _____
ALTERNATE FACILITY _____ ID. NO. _____
ADDRESS _____

CSSI REQ. NO. _____ BILL OF LADING NO. _____ WEIGHT TICKET NO. _____ GROSS _____

Manifest 24367

Chemical	Formulation	Hazard Class	ID#	EPA#	RQ=	Comments	Net Weight	Gross Weight
Atrazine	80W						1.2	1.5
Atrazine +Metolachlor	4.5L						4.4	22.5
Benefin	1.5E						1.5	10.8
Butylate	6E						12.0	22.3
C G A 17020	5%G						0.4	8.0
C G A 17020	10%G						0.8	8.0
C G A 29696	80W						1.6	2.0
D C P A	75W						6.0	8.0
Metolachlor	5%G						0.4	3.0
Metolachlor	10%G						0.8	8.0
Napropamide	50W						5.0	10.0
Prometon +Ametryn	2.07L						2.3	11.3
Prometon +Pentachlorophenol	WEI	EHW		P090			1.0	19.7
Propachlor	65W						5.2	8.0
Simazine	4L						4.0	12.3
							47.1	160.6

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.

ID. NO. ORD 08 945 2353

ARLINGTON (503) 454-2777

BELLEVUE (206) 827-0711

PORTLAND (503) 223-1912

VANCOUVER, B.C. (604) 688-7612

24368

GENERATOR Yakima Agric. Res. Lab., USDA/ARSID. NO. WAD 12 051 3857ADDRESS 3706 W Nob Hill Blvd, Yakima, WA 98902PHONE (509) 575 5977

WASTE DESCRIPTION	CONTAINER		GAL.	LB.	FT.
	QUANTITY	TYPE			
See List Attached To This Form	01	Drum	55	120.8	7.36

DOT SHIPPING NAME Insecticides-Dry&Liquid, NOSDOT HAZARD CLASS Poison BPHYSICAL STATE (circle) SOLID LIQUID SLUDGE OTHER _____MAJOR HAZARD (circle) TOXIC CORROSIVE IGNITABLE REACTIVE OTHER _____

SPECIAL INSTRUCTIONS (HANDLING/EMERGENCY) _____

IN THE EVENT OF A SPILL, CONTACT EITHER OF THE CHEM-SECURITY SYSTEMS OFFICES
AND/OR CONTACT, IN THE UNITED STATES, THE NATIONAL RESPONSE CENTER, U.S.COAST
GUARD (800) 424-8802, OR CONTACT, IN CANADA, TRANSPORT CANADA (613) 996-6666
FOR EMERGENCY ASSISTANCE.

Title to all materials furnished for disposal herein shall be deemed to be vested in Chem-Security Systems, Inc., immediately upon acceptance of such materials by Chem-Security Systems, Inc., from the generator or transporter. The generator shall have no right to recovery nor any credit for the potential value of any substances contained in such materials furnished for disposal, except as separately agreed in writing by Chem-Security Systems, Inc. Disposal operations by Chem-Security Systems, Inc., will be in accordance with procedures approved by the Oregon Department of Environmental Quality and the United States Environmental Protection Agency.

This is to certify that the above-named materials are properly classified, described, packaged, marked, labeled and are in proper condition for transportation according to the applicable regulations of the U.S. Department of Transportation and the U.S. Environmental Protection Agency. Signed and dated by the authorized agent of the generator:

GENERATOR SIGNATURE _____ DATE 15 October

TRANSPORTER _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

TREATMENT FACILITY OR COLLECTION SITE _____ ID. NO. _____

ADDRESS _____ PHONE _____

SIGNATURE _____ DATE _____

ALTERNATE TRANSPORTER NO. 1 _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

ALTERNATE TRANSPORTER NO. 2 _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

ALTERNATE FACILITY _____ ID. NO. _____

ADDRESS _____

CSSI REQ. NO. _____ BILL OF LADING NO. _____ WEIGHT TICKET NO. _____ GROSS _____

SECTION

QUAD

DEPTH

TARE

Manifest 24368

Chemical	Formulation	Hazard Class	ID#	EPA#	RQ=	Comments	Net Weight	Gross Weight
C G A 38140	50W						0.2	0.4
Carbofuran	10%G		UN2757			Poison B	3.0	30.0
Chlorothalonil	75W						1.5	2.0
Copper hydroxide	54W		UN2775			Poison B	5.0	11.0
Cyhexatin	50W						0.8	1.5
Dimethoate	25W	EHW		P044			0.3	1.0
Dinocap	4E						4.0	13.3
ETMT	30W						0.6	2.0
Fenaminosulf	35W						2.3	6.5
Isazophos	10%G						0.5	5.0
Maleic hydrazide	3E	DW		U148			3.0	12.3
Phorate	10%G	EHW		P094			1.0	10.5
Phosmet	50W						1.9	3.8
Progargite	30W		N2765		10	ORM-E	2.4	8.0
Stirofos	75W						4.1	5.5
Zinc-Maneb	80W						6.4	8.0
							<u>37.0</u>	<u>120.8</u>

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.



ID. NO. OPD 08 945 2353
ARLINGTON (503) 454-2777
BELLEVUE (206) 827-0711

PORTLAND (503) 223-1912
VANCOUVER, B.C. (604) 688-7612

24369

GENERATOR Yakima Agric. Res. Lab., USDA/ARS

ID. NO. WAD 12 051 3957

ADDRESS 3706 W Nob Hill Blvd, Yakima, WA 98902

PHONE (509) 575 5877

WASTE DESCRIPTION	CONTAINER		GAL.	LB.	FT.
	QUANTITY	TYPE			
See List Attached To This Form	01	Drum	55	228.1	7.36

DOT SHIPPING NAME Insecticide-Liquid, NCS

DOT HAZARD CLASS Poison B

PHYSICAL STATE (circle) SOLID LIQUID SLUDGE OTHER _____

MAJOR HAZARD (circle) TOXIC CORROSIVE IGNITABLE REACTIVE OTHER _____

SPECIAL INSTRUCTIONS (HANDLING/EMERGENCY) _____

**IN THE EVENT OF A SPILL, CONTACT EITHER OF THE CHEM-SECURITY SYSTEMS OFFICES
AND/OR CONTACT, IN THE UNITED STATES, THE NATIONAL RESPONSE CENTER, U.S. COAST
GUARD (800) 424-8802, OR CONTACT, IN CANADA, TRANSPORT CANADA (613) 996-6666
FOR EMERGENCY ASSISTANCE.**

Title to all materials furnished for disposal herein shall be deemed to be vested in Chem-Security Systems, Inc., immediately upon acceptance of such materials by Chem-Security Systems, Inc., from the generator or transporter. The generator shall have no right to recovery nor any credit for the potential value of any substances contained in such materials furnished for disposal, except as separately agreed in writing by Chem-Security Systems, Inc. Disposal operations by Chem-Security Systems, Inc., will be in accordance with procedures approved by the Oregon Department of Environmental Quality and the United States Environmental Protection Agency.

This is to certify that the above-named materials are properly classified, described, packaged, marked, labeled and are in proper condition for transportation according to the applicable regulations of the U.S. Department of Transportation and the U.S. Environmental Protection Agency. Signed and dated by the authorized agent of the generator:

GENERATOR SIGNATURE _____ DATE 15 October 1987

2 TRANSPORTER _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

3 TREATMENT FACILITY OR COLLECTION SITE _____ ID. NO. _____

ADDRESS _____ PHONE _____

SIGNATURE _____ DATE _____

4 ALTERNATE TRANSPORTER NO. 1 _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

ALTERNATE TRANSPORTER NO. 2 _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

ALTERNATE FACILITY _____ ID. NO. _____

ADDRESS _____

5 CSSI REQ. NO. _____ BILL OF LADING NO. _____ WEIGHT TICKET NO. _____ GROSS _____

Manifest 24369

Chemical	Formulation	Hazard Class	ID#	EPA#	RQ=	Comments	Net Weight	Gross Weight
Cycloate	6E						34.0	75.0
Demeton	2E						2.0	11.3
Desmidipham	1.3E						6.5	47.0
Methamidophos	4WM						4.0	13.3
Mevinphos	4E		N2783		1	Poison B	12.0	39.6
Oxydemeton-Methyl	2E						2.0	11.3
Perthane	4E						4.0	13.3
Phosphamidon	8E						8.0	17.3
							<u>72.5</u>	<u>228.1</u>

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.

Manifest 35499

Chemical	Formulation	Hazard Class	ID#	EPA#	RQ=	Comments	Net Weight	Gross Weight
Bay SRA 12869	6EC						7.89	10.50
C G A 73102	10%G						0.15	1.50
COCS	100%						0.79	0.79
DPX 5444	2EC						0.25	1.00
Ethoprop	6EC						2.25	3.00
Ethoprop	10%G						1.15	11.50
Fensulfothion	6E						0.98	1.29
Fensulfothion	15%G						4.42	29.46
Fonofos	4E						5.87	11.75
Isofenphos	6SC						0.75	1.00
Isofenphos	20%G						2.90	14.50
Lindane	20%	EHW		U129			0.40	2.00
M 9070	10%G						0.009	0.009
M 9525	10%G						0.009	0.009
Methamidophos	4EC						6.25	12.50
Methyl bromide	100%	EHW	UN 1062	U029		Poison B	1.00	1.00
Naled	8E		NA 2783		1	ORM-E	31.75	31.75

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.

Manifest 35499 (continued)

Chemical	Formulation	Hazard Class	ID#	EPA#	RQ=	Comments	Net Weight	Class Weight
NC 6897	10%G						0.57	5.70
RE 27644	10%G						0.27	2.75
SN 72129	5%G						0.03	0.68
SN 72129	50WP						0.14	0.28
TEPP	40%	EHW	NA2783	P111	100	Poison B	5.20	13.00
UC 54063	50W						0.88	1.75
UC 54229	100S						1.00	1.00
UC 67546	75W						3.75	5.00
							<u>78.648</u>	<u>163.718</u>

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.



STAR ROUTE, ARLINGTON, OR. 97812

CHEMICAL TRANSPORTATION MANIFEST

ID. NO. ORD 08 945 2353

24370

ARLINGTON (503) 454-2777

PORTLAND (503) 223-1912

BELLEVUE (206) 827-0711

VANCOUVER, B.C. (604) 688-7612

1

GENERATOR Yakima Agric. Res. Lab., USDA/ARSID. NO. WAD 12 051 3957ADDRESS 3706 W Nob Hill Blvd, Yakima, WA 98902PHONE (509) 575 5877

WASTE DESCRIPTION	CONTAINER		GAL.	LB.	FT.
	QUANTITY	TYPE			
See List Attached To This Form	01	Drum	55	110.9	7.36

DOT SHIPPING NAME Insecticide-Dry&Liquid DOT HAZARD CLASS Poison 8, Flammable, CorrosivePHYSICAL STATE (circle) SOLID LIQUID SLUDGE OTHER _____MAJOR HAZARD (circle) TOXIC CORROSIVE IGNITABLE REACTIVE OTHER _____

SPECIAL INSTRUCTIONS (HANDLING/EMERGENCY) _____

IN THE EVENT OF A SPILL, CONTACT EITHER OF THE CHEM-SECURITY SYSTEMS OFFICES
AND/OR CONTACT, IN THE UNITED STATES, THE NATIONAL RESPONSE CENTER, U.S. COAST
GUARD (800) 424-8802, OR CONTACT, IN CANADA, TRANSPORT CANADA (613) 996-6666
FOR EMERGENCY ASSISTANCE.

Title to all materials furnished for disposal herein shall be deemed to be vested in Chem-Security Systems, Inc., immediately upon acceptance of such materials by Chem-Security Systems, Inc., from the generator or transporter. The generator shall have no right to recovery nor any credit for the potential value of any substances contained in such materials furnished for disposal, except as separately agreed in writing by Chem-Security Systems, Inc. Disposal operations by Chem-Security Systems, Inc., will be in accordance with procedures approved by the Oregon Department of Environmental Quality and the United States Environmental Protection Agency.

This is to certify that the above-named materials are properly classified, described, packaged, marked, labeled and are in proper condition for transportation according to the applicable regulations of the U.S. Department of Transportation and the U.S. Environmental Protection Agency. Signed and dated by the authorized agent of the generator:

GENERATOR SIGNATURE _____ DATE 13 October 1994

2

TRANSPORTER _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

3

TREATMENT FACILITY OR
COLLECTION SITE _____ ID. NO. _____

ADDRESS _____ PHONE _____

SIGNATURE _____ DATE _____

4

ALTERNATE
TRANSPORTER NO. 1 _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

ALTERNATE
TRANSPORTER NO. 2 _____ ID. NO. _____

ADDRESS _____ PHONE _____

TRANSPORTER SIGNATURE _____ DATE _____

ALTERNATE FACILITY _____ ID. NO. _____

ADDRESS _____

5

CSSI
REQ. NO. _____ BILL OF LADING NO. _____ WEIGHT TICKET NO. _____ GROSS _____

Manifest 24370

Chemical	Formulation	Hazard Class	ID#	EPA#	RQ=	Comments	Net Weight	Gross Weight
Antiozonant	88						0.22	0.22
Bay SIR 8514	25WP						1.12	4.48
Benzylamine	100%						0.33	0.33
Butyl lithium in hexane	64%						1.48	2.31
Butyraldehyde	100%		UN1129			Flammable	6.61	6.61
Butyryl chloride	100%						5.51	5.51
Chlorpyrifos	15%G		NA2783		1	ORM-A	6.68	44.53
Di-flubenzuron	25W						0.50	2.00
3,5-Dinitrobenzyl- chloride	100%		UN1577			Poison B	0.28	0.28
ENT 2543	100%						0.31	0.31
Fensulfothion	6E						0.45	0.61
Fenvalerate	2.4EC						0.60	2.00
Fonofos	20%G						2.00	10.00
2,4-Hexadienoic acid	100%		UN2458			Flammable	0.88	0.88
Hexanoic acid	100%		NA1760			Corrosive	2.20	2.20

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.

Manifest 24370

Chemical	Formulation	Hazard Class	ID#	EPA#	RQ=	Comments	Net Weight	Gross Weight
Antiozonant	88						0.22	0.22
Bay SIR 8514	25WP						1.12	4.48
Benzylamine	100%						0.33	0.33
Butyl lithium in hexane	64%						1.48	2.31
Butyraldehyde	100%		UN1129			Flammable	6.61	6.61
Butyryl chloride	100%						5.51	5.51
Chlorpyrifos	15%G		NA2783		1	ORM-A	6.68	44.53
Diiflubenzuron	25W						0.50	2.00
3,5-Dinitrobenzyl- chloride	100%		UN1577			Poison B	0.28	0.28
ENT 2543	100%						0.31	0.31
Fensulfothion	6E						0.45	0.61
Fenvalerate	2.4EC						0.60	2.00
Fonofos	20%G						2.00	10.00
2,4-Hexadienoic acid	100%		UN2458			Flammable	0.88	0.88
Hexanoic acid	100%		NA1760			Corrosive	2.20	2.20

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA.

APPENDIX A-3

HAZARDOUS WASTE MANIFESTS FOR 1984

YAKIMA AGRICULTURAL RESEARCH LABORATORY

TRANSPORTATION COMPANY ENDERED TO TOP THIS CAR OR TRUCK AT		ROUTE ORDER/RELEASE NO.	
IMPORTANT Issuing office is to retain one memorandum copy and send one to the fiscal office		CAR TRUCK CONTAINER ORDERED FURNISHED MARKED CAPACITY ORDERED FURNISHED DATE FURNISHED DATE B/L ISSUED 11/27/84	
IF TRUCK OR CONTAINER INITIALS NO NO		If extra services are ordered see Administrative Directions No 2 on reverse	
Received by the transportation company named above, subject to conditions stated on reverse hereof, the property hereinafter described, in apparent good order and condition (contents and value unknown), to be forwarded to destination by the said company and connecting lines, there to be delivered in the good order and condition to said consignee		FROM USDA-ARS (Shipping point) YAKIMA, WA FULL NAME OF SHIPPER USDA-ARS 3706 W. Nob Hill Blvd./Yakima, WA 98902	
SIGNEE (Name, address and ZIP code) Chem-Security Systems, Inc. Star Route Arlington, Oregon 97812		MARKS	
ESTINATION (Name, address and ZIP code of installation) Chem-Security Systems, Inc. - approximately 7 miles beyond Arlington on the Condon Highway		BILL CHARGES TO (Dept., agency, bureau/office, mailing address and ZIP code) USDA-National Finance Center P. O. Box 60000 New Orleans, LA 70160	
If Route shipment when advantageous to the Government		APPROPRIATION CHARGEABLE 5015705031 50% 5015705033 50%	
SEAL NUMBERS		FOR CARRIER'S USE ONLY — WAYBILL NO. OR FREIGHT BILL NO.	
APPLIED BY		Contractor will return unused or canceled bills of lading to the Government office from which received.	
PACKAGES NO KIND		DESCRIPTION OF ARTICLES (Use carrier's classification or tariff description if possible; otherwise use a clear nontechnical description)	
7 DRUM		Pesticides for Disposal	
		Manifest #	
		Barrel#1 00228 246 lb	
		Barrel#2 00229 240 lb	
		Barrel#3 01505 235 lb	
		Barrel#4 01506 210 lb	
		Barrel#5 01507 242 lb	
		Barrel#6 01508 226 lb	
		Barrel#7 01509 450 lb	
		Generator's US EPA ID NO.: WA8120513957	
		TARIFF OR SPECIAL RATE AUTHORITIES (CL, TL or Vol. only)	
If this shipment fully loads the car or truck used check <input type="checkbox"/> YES			
ISSUER FURNISHED SERVICE AT ORIGIN — TRUCK — TRAP CAR Initials of shipper's agent		B/L NO S- 7825623	
NAME OF TRANSPORTATION COMPANY Oak Harbor Freight Lines		FOR USE OF ISSUING OFFICE 40-0540-5-069	
DATE OF RECEIPT OF SHIPMENT 11/25/84		DATE 11/28/84	
AGENT 11/25/84		ISSUING OFFICE (Name and city) YAKIMA, WA	
PER 7/11/84		ISSUING OFFICE (Name and city) USDA-ARS 3706 W. Nob Hill Blvd./Yakima, WA 98902	
CONSIGNMENT DELIVERED COMPLETE AND IN APPARENT GOOD ORDER EXCEPT AS MAY BE INDICATED HEREAFTER		SERVICE FURNISHED BY CARRIER AT DESTINATION <input type="checkbox"/> DELIVERY <input type="checkbox"/> TRAP-CAR	

PURCHASE ORDER

0505-0005

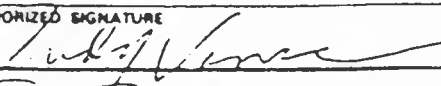
1 PAGE NUMBER	2 RECEIVING OFFICE NO	3 CONTRACT NUMBER	4 ORDER DATE	5 SF. 37	6 UNIT CODE	7 FUND CODE	8 ORDER NUMBER	9 S/U
1 of 1	0540	Open Market	1128884	5		T5	40-0540-5-069	

10 TO (Seller)	11 SHIP TO (Consignee and Destination)
Chem-Security Systems, Inc. Star Route Arlington, Oregon 97812 (503)454-2643	USDA Agricultural Research Service 3706 W. Nob Hill Blvd Yakima, WA 98902

13 ACT CODE	14 DESCRIPTION	15 BUDGET OBJECT	16 ACC. LINE	17 QUANTITY	18 UNIT ISSUE	19 UNIT PRICE	20 AMOUNT
	Disposal of hazardous waste - pesticides	2312	1	7	BL	90.00	630.00
	Price Quote per Chem Securities 11/27/84.						
	Freight converted to GBL 7,825,623.						

Destination	22 DISCOUNT TERMS Net 30 days	0	25 Sub-Total	630.00
TIME FOR DELIVERY 11/28/84	24 SHIP VIA Surface	26 ESTIMATED FREIGHT -0-	27 TOTAL	630.00

23 ACCOUNTING CLASSIFICATION						30 DISTRIBUTION	31 AMOUNT
A	B	C	D	E	F		
5	10	5	3	1	4	1	2
	5015705031 5015705033					50% 50%	

OFFICE NAME AND ADDRESS Agricultural Research Service 3706 W. Nob Hill Blvd. Yakima, WA 98902	ORDERED BY (Name and Title) JUDY VANCE/Purchasing Agent PHONE (Area Code and Number) (509)575-5978 FTS 446-5978 AUTHORIZED SIGNATURE 
--	--

UNIFORM HAZARDOUS
WASTE MANIFEST1. Generator's US EPA ID No
WAD120513957Manifest
Document No
002282. Page 1
of 1Information in the shaded areas is
not required by Federal law

3. Generator's Name and Mailing Address

Yakima Agric Res Lab USDA/ARS
3706 W Nob Hill Blvd, Yakima, WA 98902

4. Generator's Phone (509) 575-5877

5. Transporter 1 Company Name

6. US EPA ID Number

7. Transporter 2 Company Name

8. US EPA ID Number

9. Designated Facility Name and Site Address

Chem-Security Systems, Inc.
Star Route
Arlington, Oregon 97812

10. US EPA ID Number

ORD 089 452 353

A. State Manifest Document Number

B. State Generator's ID

C. State Transporter's ID

D. Transporter's Phone

E. State Transporter's ID

F. Transporter's Phone

G. State Facility's ID

H. Facility's Phone

503-454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)

12. Containers

No

Type

13. Total
Quantity14. Unit
Wt VolEPA / I.
Waste No.a. See attached sheet--- Contains Poison B, EHW, and
X P039, and P094 34.8 lb Net weight

1

556

Drum

LB

246

b.

c.

d.

J. Additional Descriptions for Materials Listed Above

a.

b.

c.

d.

K. Handling Codes for Wastes Listed Above

15. See a. Handling Instructions and Additional Information Waste Profile Sheet Number(s)

a. 050348

b.

c.

d.

16. GENERATOR'S CERTIFICATION I hereby declare that the contents of this consignment are fully and accurately described above by proper
shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway
according to applicable international and national governmental regulations.

Printed/Typed Name

Signature

Date

Month Day Year

Dr. F. E. Dolphin

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date

Month Day Year

Dick Wetsch

11 28 34

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name

Signature

Date

Month Day Year

GENERATOR

TRANSPORTER

FACILITY

UNIFORM HAZARDOUS WASTE MANIFEST		1 Generator's US EPA ID No WAD120513957	Manifest Document No. 100229	2 Page 1 of 1	Information in the shaded areas is not required by Federal law
3 Generator's Name and Mailing Address Yakima Agric Res Lab USDA/ARS 3706 W Nob Hill Blvd, Yakima, WA 98902			A. State Manifest Document Number		
4 Generator's Phone (509 575 5877			B. State Generator's ID		
5 Transporter 1 Company Name		6 US EPA ID Number	C. State Transporter's ID		
7 Transporter 2 Company Name		8 US EPA ID Number	D. Transporter's Phone		
9 Designated Facility Name and Site Address Chem-Security Systems, Inc. Star Route Arlington, Oregon 97817		10 US EPA ID Number ORD 089 452 353	E. State Transporter's ID		
			F. Transporter's Phone		
			G. State Facility's ID		
			H. Facility's Phone 503-454-2643		
11 US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)		12 Containers No Type	13 Total Quantity	14 Unit Wt./Vol	EPA Waste No
a See attached sheet---Contains Poison B and UN2757 17 lb net weight		1 556 Drum		240 lb	
b					
c					
d					
J Additional Descriptions for Materials Listed Above a. b. c. d.			K Handling Codes for Wastes Listed Above		
15 Special Handling Instructions and Additional Information Waste Profile Sheet Number(s) a. DS0348 b. c. d.					
16 GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.					
Printed/Typed Name Dr. R. L. Dolphin			Signature		Date Month Day Year
17. Transporter 1 Acknowledgement of Receipt of Materials			Signature		Date
Printed/Typed Name Dick Vetsch			Signature		Month Day Year 11 25 84
18. Transporter 2 Acknowledgement of Receipt of Materials			Signature		Date
Printed/Typed Name			Signature		Month Day Year
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.					
Printed/Typed Name			Signature		Date Month Day Year

UNIFORM HAZARDOUS
WASTE MANIFEST1 Generator's US EPA ID No
WAD120513957Manifest
Document No
015052 Page 1
of 1Information in the shaded areas is
not required by Federal law3 Generator's Name and Mailing Address
Yakima Agric Res Lab USDA/ARS
3706 W Mob Hill Blvd, Yakima WA 98902
4 Generator's Phone (509) 575 5877

A. State Manifest Document Number

B. State Generator's ID

5 Transporter 1 Company Name

6 US EPA ID Number

C. State Transporter's ID

D. Transporter's Phone

7 Transporter 2 Company Name

8 US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9 Designated Facility Name and Site Address

10 US EPA ID Number

G. State Facility's ID

Chem-Security Systems, Inc.
Star Route
Arlington, Oregon 97812

ORD 089 452 353

H. Facility's Phone
503-454-2643

11 US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)

12 Containers

No

Type

13 Total
Quantity14 Unit
Weight15 EPA/
Waste Noa. X See attached sheet--- Contains Poison B, EHW, P069, P
P050, P066, P045, UN2757, and HA2783
37/6 1b Net weight

P

55G

1

Drum

235

LB

b.
c.
d.

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

a.
b.
c.
d.

15 See a. Handling Instructions and Additional Information Waste Profile Sheet Number(s)

a. 250348
b.
c.
d.16 GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper
shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway
according to applicable international and national governmental regulations

Printed/Typed Name

Signature

Date
Month Day Year

17 Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date
Month Day Year

Dick Vetsch

11 28 84

18 Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date
Month Day Year

19 Discrepancy Indication Space

20 Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Date
Month Day Year

UNIFORM HAZARDOUS
WASTE MANIFEST1 Generator's US EPA ID No
WA120513957Manifest
Document No
015062 Page 1
of 1Information in the shaded areas is
not required by Federal law3 Generator's Name and Mailing Address
Yakima Agric Res Lab USDA/ARS
3706 W Nob Hill Blvd, Yakima, WA 98902
4 Generator's Phone: 509 575-5877

A State Manifest Document Number

B State Generator's ID

5 Transporter 1 Company Name

6 US EPA ID Number

C State Transporter's ID

7 Transporter 2 Company Name

8 US EPA ID Number

D Transporter's Phone

E State Transporter's ID

F Transporter's Phone

9 Designated Facility Name and Site Address

10

US EPA ID Number

G State Facility's ID

Chem-Security Systems, Inc.
Star Route
Arlington, Oregon 97812

ORD 089 452 353

H Facility's Phone
503-454-2643

11 US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)

12 Containers

No.

Type

13
Total
Quantity14
Unit
Wt. VolEPA/
Waste Noa X See attached sheet---Contains Poison B, EHW, U061
and P094 43.2 lb Net weight

1

55G
Drum210
LB

b

c

d

J Additional Descriptions for Materials Listed Above

K Handling Codes for Wastes Listed Above

a.
b.
c.
d.

15 See a Handling Instruction and Additional Information Waste Profile Sheet Number(s)

a. D50348
b.
c.
d.16 GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper
shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway,
according to applicable international and national governmental regulations.

Printed/Typed Name

Signature

Date
Month Day Year

Dr. E. E. Dolph

17 Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date
Month Day Year

Dick Vetsch

18 Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date
Month Day Year

19 Discrepancy Indication Space

20 Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19

Printed/Typed Name

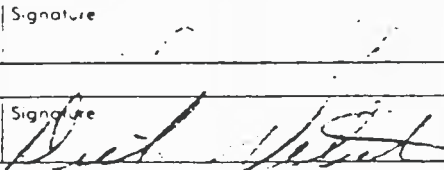

Signature

Date
Month Day Year

GENERATOR

TRANSPORTER

FACILITY

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. WAD120513957	Manifest Document No. 01507	2. Page 1 of 1	Information in the shaded areas is not required by Federal law
3. Generator's Name and Mailing Address Yakima Agric Res Lab USDA/ARS 3706 W Mob Hill Blvd, Yakima, WA 98902			A. State Manifest Document Number		
4. Generator's Phone: 509 575-5877			B. State Generator's ID		
5. Transporter 1 Company Name		6. US EPA ID Number	C. State Transporter's ID		
7. Transporter 2 Company Name		8. US EPA ID Number	D. Transporter's Phone		
9. Designated Facility Name and Site Address Chem-Security Systems, Inc. Star Route Arlington, Oregon 97812		10. US EPA ID Number ORD 089 452 353	E. State Transporter's ID		
			F. Transporter's Phone		
			G. State Facility's ID		
			H. Facility's Phone 503-454-2643		
11. US DOT Description, Including Proper Shipping Name, Hazard Class, and ID Number(s)			12. Containers No. Type	13. Total Quantity	14. EPA/1 Waste No.
a. X See attached sheet---Contains Poison B, EHW, P050, P051, U122, U247, P089, P123, U240, NA 2783, and R2765 52.9 LB Net weight			1. 55G Drum	242 LB	
b.					
c.					
d.					
J. Additional Descriptions for Materials Listed Above			K. Handling Codes for Wastes Listed Above		
a.					
b.					
c.					
d.					
15. Select Handling Instructions and Additional Information. Waste Profile Sheet Number(s) a. D50348 b. c. d.					
16. GENERATOR'S CERTIFICATION. I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.					
Printed, Typed Name Dr. A. E. Dolphin			Signature 		Date Month Day Year 11 28 84
17. Transporter 1 Acknowledgement of Receipt of Materials			Date		
Printed, Typed Name Dick Vetsch			Signature 		Month Day Year 11 28 84
18. Transporter 2 Acknowledgement of Receipt of Materials			Date		
Printed, Typed Name			Signature		Month Day Year
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.					
Printed, Typed Name			Signature		Date Month Day Year

GENERATOR

TRANSPORTER

FACILITY

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No WAD120513957	Manifest Document No 01508	2. Page 1 of 1	Information in the shaded areas is not required by Federal law
3. Generator's Name and Mailing Address Yakima Agric Res Lab USDA/ARS 3706 W Nob Hill Blvd, Yakima, WA 98902			A. State Manifest Document Number		
4. Generator's Phone (509) 575-5877			B. State Generator's ID		
5. Transporter 1 Company Name	6. US EPA ID Number	C. State Transporter's ID			
7. Transporter 2 Company Name	8. US EPA ID Number	D. Transporter's Phone			
9. Designated Facility Name and Site Address Chem-Security Systems, Inc. Star Route Arlington, Oregon 97812	10. US EPA ID Number	E. State Transporter's ID			
		F. Transporter's Phone			
		G. State Facility's ID			
		H. Facility's Phone 503-454-2643			
11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers No. Type	13. Total Quantity	4. Unit Vol	EPA / Waste No
a. X See attached sheet---Contains Poison B, EHW, P050 and U240 28.1 LB Net weight		1 55G Drum		226 LB	
b.					
c.					
d.					
J. Additional Descriptions for Materials Listed Above a. b. c. d.		K. Handling Codes for Wastes Listed Above			
L. Special Handling Instructions and Additional Information Waste Profile Sheet Number(s) a. D50343 b. c. d.					
M. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, according to applicable international and national governmental regulations.					
Printed/Typed Name Dr. J. R. ...		Signature 		Date Month Day Year 11 28 84	
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name Dick Vetsch		Signature 		Date Month Day Year 11 28 84	
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name		Signature		Date Month Day Year	
19. Discrepancy Indication Space					
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.					
Printed/Typed Name		Signature		Date Month Day Year	

GENERATOR

TRANSPORTER

FACILITY

UNIFORM HAZARDOUS
WASTE MANIFEST1 Generator's US EPA ID No
WAD120513957Manifest
Document No
1015092 Page 1
of 1Information in the shaded areas is
not required by Federal law

3 Generator's Name and Mailing Address

Yakima Agric. Res. Lab. USDA/ARS
3706 W Nob Hill Blvd, Yakima, WA 98902

4 Generator's Phone (509) 575-5877

A. State Manifest Document Number

B. State Generator's ID

5 Transporter 1 Company Name

6

US EPA ID Number

C. State Transporter's ID

D. Transporter's Phone

7 Transporter 2 Company Name

8

US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9 Designated Facility Name and Site Address

10

US EPA ID Number

G. State Facility's ID

Chem-Security Systems, Inc.
Star Route
Arlington, Oregon 97812

ORD 089 452 353

H. Facility's Phone

503-454-2643

US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)

12 Containers

No

Type

13
Total
Quantity14
Unit
Wt/VolEPA/
Waste NoX SEE ATTACHED SHEET---Contains Poison B, EHW and P066 1
0.45 LB Net weight55G
Drum450
LB

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

L. Special Handling Instructions and Additional Information Waste Profile Sheet Number(s)

a. D50348
b.
c.
d.

6 GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

Printed/Typed Name

Signature

Date

Month Day Year

7 Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date

Month Day Year

8 Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date

Month Day Year

19 Discrepancy Indication Space

20 Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Date

Month Day Year

GENERATOR'S COPY

YAKIMA AGRIC RES LAB-1984-PESTICIDES FOR DISPOSAL

MANIFEST #00228, BARREL #1

CHEMICAL	FORMULATION	HAZARD CLASS	ID#	EPA#	RQ=	NET WEIGHT	GROSS WEIGHT
Carbosulfan	25%WP					1.24 kg	2.27 kg
Disulfoton	15%G	EHW		P039		1.82 kg	12.14 kg
Ethoprop	10%G					1.35 kg	13.5 kg
Ethoprop	15%G					1.52 kg	10.13 kg
Ethoprop	20%G					3.00 kg	15.00 kg
Isofenphos	20%G					2.20 kg	11.00 kg
LS-81-5877	15%G					0.61 kg	4.08 kg
Methiocarb	50%WP					0.52 kg	1.04 kg
Metribuzin	75%WP					0.34 kg	0.45 kg
Mobil RJH276075	15%G					0.02 kg	0.13 kg
Mobil RJH276074	15%G					0.02 kg	0.13 kg
Mobil RJH276073	15%G					0.02 kg	0.13 kg
Phorate	20%G	EHW		P094		1.97 kg	9.87 kg
Terbufos	15%G					1.26 kg	8.34 kg

YAKIMA AGRIC LAB-1984-PESTICIDES FOR DISPOSAL

MANIFEST #00229, BARREL #2

CHEMICAL	FORMULATION	HAZARD CLASS	ID#	EPA#	RQ=	NET WEIGHT	GROSS WEIGHT
Carbofuran	10%G		UN2757			0.43 kg	4.32 KG
Carbosulfan	25%WP					1.14 kg	4.56 kg
Carbosulfan	15%G					1.14 kg	4.56 kg
DPX 8175	5%G					0.005 kg	0.10 kg
Fensulfothion	15%G					2.03 kg	13.53 kg
Fonofos	10%G					1.59 kg	15.89 kg
Isofenphos	20%G					0.32 kg	1.59 kg
Isofenphos	6EC					0.38 kg	0.52 kg
Terbufos	15%G					0.68 kg	4.54 kg

YAKIMA AGRIC RES LAB-1984-PESTICIDES FOR DISPOSAL
MANIFEST #01505, BARREL #3

CHEMICAL	FORMULATION	HAZARD CLASS	ID#	EPA#	RQ=	NET WEIGHT	GROSS WEIGHT
Aldicarb	15%G	EHW		P069		0.82 kg	5.45 kg
Bay ARL3800	10%G					0.07 kg	0.68 kg
Bay ARL4077	10%G					0.02 kg	0.23 kg
Bay FCP1272	200EC					0.19 kg	0.76 kg
Bay MAT5155	50%WP					0.23 kg	0.45 kg
Bay MAT5927	50%WP					0.23 kg	0.45 kg
Bay SIR8514	25%WP					0.62 kg	2.50 kg
Bay SIR14591	25%WP					0.11 kg	0.46 kg
BTS48011	50%FL					0.23 kg	0.45 kg
Carbofuran	4F		UN2757			2.04 kg	4.38 kg
Chlorpyrifos	4E		NA2783			0.17 kg	0.91 kg
Cypermethrin	2.5EC					0.03 kg	0.10 kg
Decamethrin	2.5%EC					0.01 kg	0.40 kg
Demeton	6E					5.56 kg	7.72 kg
Diazinon	2FM					0.01 kg	0.05 kg
Endosulfan	3EC	EHW		P050		1.53 kg	3.57 kg
Fenamiphos	3E					0.34 kg	1.00 kg
Fenvalerate	2.4E					1.91 kg	6.58 kg
FMC54800	2E					0.03 kg	0.11 kg
HAG-107	0.3E					0.03 kg	0.11 kg
Isofenphos	6EC					0.38 kg	9.08 kg
Methamidophos	10%G					0.20 kg	2.04 kg
Methomyl	1.8EC	EHW		P066		0.20 kg	0.94 kg

MANIFEST #01505, BARREL #3

Page 2

CHEMICAL	FORMULATION	HAZARD CLASS	ID#	EPA#	RQ=	NET WEIGHT	GROSS WEIGHT
NK936	0.03SL <i>slurry</i>					0.003 kg	0.11 kg
Monocrotophos	5EC					0.57 kg	0.95 kg
Oxamyl	2E					0.80 kg	3.18 kg
Permethrin	2E <i>emulsion</i>					0.23 kg	0.91 kg
Resmethrin	2EC					0.11 kg	0.46 kg
RH0994	4EC					0.28 kg	0.57 kg
RU25474	0.3EC					0.02 kg	0.06 kg
Thiofanox	10%G	EHW		P045		0.14 kg	1.36 kg

YAKIMA AGRIC RES LAB-1984-PESTICIDES FOR DISPOSAL

MANIFEST #01506, BARREL #4

CHEMICAL	FORMULATION	HAZARD CLASS	ID#	EPA#	RQ#	NET WEIGHT	GROSS WEIGHT
DDT	20%E	EHW		U061		0.10 kg	0.48 kg
Fonofos	10%G					0.81 kg	8.14 kg
Fonofos	20%G					2.27 kg	11.35 kg
Malathion	25%E					0.89 kg	3.58 kg
Malathion	50%E					0.05 kg	0.14 kg
Oxydemetonmethyl	25%E					3.81 kg	15.24 kg
Phorate	15%G	EHW		P094		2.21 kg	14.76 kg
RU25474	0.3EC					0.03 kg	0.11 kg
Sulfur	75%P					0.24 kg	0.32 kg
Trichlorfon	40.5%E					6.95 kg	17.16 kg
Vernolate	6.7E					2.28 kg	2.85 kg
						<u>19.69 kg</u>	<u>74.13</u>
						43.21 lb	163.09 lb

YAKIMA AGRIC RES LAB-1984-PESTICIDES FOR DISPOSAL

MANIFEST #01507, BARREL #5

CHEMICAL	FORMULATION	HAZARD CLASS	ID#	EPA#	RQ=	NET WEIGHT	GROSS WEIGHT
Azinphosmethyl	50%WP					0.68 kg	1.36 kg
Benomyl	50%WP					0.45 kg	0.91 kg
Chlorpyrifos	4E		NA 2783		1	1.59 kg	4.31 kg
Diazinon	50%E					1.92 kg	4.77 kg
Dicofol	18%WP					2.78 kg	15.44 kg
Endosulfan	50%WP	EHW		P050		2.04 kg	4.09 kg
Endrin	1.6EC	EHW		P051,D012		3.63 kg	18.15 kg
Ethylan	4EC					4.54 kg	9.08 kg
Methanal	100%	EHW		U122		3.18 kg	3.18 kg
Methoxychlor	25%EC			U247,D014		0.12 kg	0.48 kg
Parathion	25%WP	EHW		P089		0.78 kg	3.18 kg
Propargite	30%W		N2765		10	0.41 kg	1.35 kg
Toxaphene	25%E	EHW		P123,U224,D015		0.12 kg	0.48 kg
2,4-D	44%	EHW		U240,D016		1.82 kg	4.77 kg

YAKIMA AGRIC RES LAB-1984-PESTICIDES FOR DISPOSAL
MANIFEST #01508, BARREL #6

CHEMICAL	FORMULATION	HAZARD CLASS	ID#	EPA#	RQ=	NET WEIGHT	GROSS WEIGHT
Amitrole	22%E					3.00 kg	14.53 kg
n-Butyl alcohol	100%					4.08 kg	4.08 kg
Dicofol	18%WP					2.94 kg	16.34 kg
Endosulfan	3EC	EHW		P050		1.84 kg	5.11 kg
Linuron	50%WP					0.68 kg	1.36 kg
2,4-D	18%	EHW		U240,D016		0.24 kg	1.36 kg

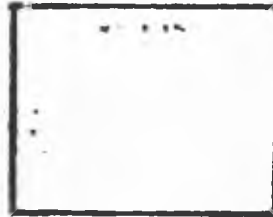
YAKIMA AGRIC RES LAB-1984-PESTICIDES FOR DISPOSAL

MANIFEST #01509, BARREL #7

CHEMICAL	FORMULATION	HAZARD CLASS	ID#	EPA#	RQ=	NET WEIGHT	GROSS WEIGHT
Acephate	75%SP					5.7g	7.6g
Diuron	80%WP					45.4g	56.8g
Fenvalerate	2.4E					27.2g	93.9g
Methamidophos	4EC					85.1g	170.3g
Methomyl	1.8EC	EHW		P066		2.0g	9.3g
Phosalone	3EC					3.7g	10.3g
Trifluralin	4EC					34.0g	68.0g

U.S. GOVERNMENT BILL OF LADING

L-0798156



Yakima, Washington

3706 N. Nob Hill Boulevard

USDA/Agricultural Research Service

3706 N. Nob Hill Boulevard/Yakima, WA 97902

Chem-Security Systems, Inc.

1000 Route

10 miles beyond Arlington on the Condon Highway

Chem-Security Systems, Inc. - approximately

10 miles beyond Arlington on the Condon Highway

Department of Agriculture

National Finance Center

P. O. Box 60000 New Orleans, LA

70160

(ZIP code) (Street address) (City) (State or country)

APPROPRIATION CHARITABLE

301-5905-20224

03

FOR CARRIER'S USE ONLY
DATE OF CERTIFICATE BILL OF

CONTRACTOR'S USE: RETURN SHIPPED OR CANCELED BILLS OF LADING TO GOVERNMENT OFFICE
FROM WHICH RECEIVED

QUANTITY	DESCRIPTION OF GOODS	WEIGHT	FOR USE OF DESTINATION CARRIER ONLY	
			CLASS	RATE
24366	DRUM Mixed pesticides* (Insecticides & herbicides)	35 lbs each		
24367				
24368				
24369				
24370				
35499				

CARRIER'S USE ONLY
DATE OF CERTIFICATE BILL OF

L-0798156

FOR USE OF ISSUING OFFICE

CONTRACTOR'S USE ONLY

Yakima, WA

J. CROOKS BROWN

Administrative Officer

USDA/ARS

3706 N. Nob Hill Blvd., Yakima, WA 97902

(Street address)

(City)

(State or country)

CERTIFICATE OF CARRIER BILLING FOR CHARGES-CONSIGNEE MUST NOT PAY ANY CHARGES ON THIS SHIPMENT

50052, 2000, 1000, 0500

APPENDIX B

WATER SUPPLY WELL RECORDS FOR YAKIMA (WA)
AS PROVIDED BY WASHINGTON DEPARTMENT OF ECOLOGY

Order Book

NW 1 SW 1 SE 1/4 Sec 34 T. 13 N. R. 18 E. M.

NW 1 SW 1 SE 1/4 Sec 34 T. 13 N. R. 18 E. M.

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Tip BOLL	0	5
BROKEN Basalt shale	5	30
BLACK BASALT	30	63
Red Broken Rock shale	63	73
BROKEN Basalt/BLACK	73	225
BROKEN Paris Rock/ Basalt	225	265
BROKEN GALT BASALT	265	340
BROKEN BROWN BASALT	340	352

Casing installed: 6" Diam. from 0 ft. to 60 ft.
 Threaded ☐ " Diam. from _____ ft. to _____ ft.
 Welded ☒ " Diam. from _____ ft. to _____ ft.

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 60 ft.
Material used in seal B. R. N. P. H. T.
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ HP _____

(8) **WATER LEVELS:** Land-surface elevation _____ ft.
 above mean sea level.
 Static level 60 _____ ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
------	-------------	------	-------------	------	-------------

Date of test _____
 Pump test 10 gal./min. with 280 ft. drawdown after 2 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water..... Was a chemical analysis made? Yes ☐ No ☒

Work started 5-26, 1978. Completed 5-31, 1978.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Eastwood Drilling Co.
(Person, firm, or corporation) (Type or print)

Address 2262 River Rd Yakima, WA

[Signed] Henry A. Miller
(Walt Butler)

License No. 0495 Date 6-1, 1978

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name (b)(6) Address (b)(6)
(2) LOCATION OF WELL: County SW 1/4 Sec 34 T. 13 N. R. 15 W.M.
Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one).....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 112 ft. Depth of completed well 106 ft.

(6) CONSTRUCTION DETAILS

Casing installed: 6" Diam. from 11 ft. to 105 ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.
Welded ☒ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name.....
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name.....
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 15 ft. below top of well Date.....
Artesian pressure _____ lbs. per square inch Date.....
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?.....
Yield: 25 gal./min. with _____ ft. drawdown after _____ hrs.
" " AIR LIFT " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

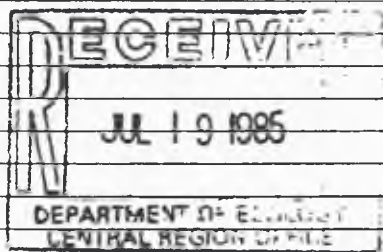
Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Ballor test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOP SOIL DK Brown	0	8
GRAVEL & CLAY	8	18
GRAVEL & CLAY LAYERS	18	106



Work started 6/5, 1985 Completed 6/7, 1985

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Paulin McGuire Drilling
(Person, firm, or corporation) (Type or print)

Address Rt 3 Box 3356

[Signed] Kirk T. H.
(Well Driller)

License No. 142 Date 6/13, 1985

STATE OF WASHINGTON

Permit No. _____

(1) OWNER: Name

(b)(6)

Address

(b)(6)

(2) LOCATION OF WELL: County YAKIMA - 14 3 1 Sec. 34 T. 13 N., R. 18 W.M.

Bearing and distance from section or subdivision corner S 117° E of 1645 FT OF E 180° of W 46 FT OF R

3) **PROPOSED USE:** Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

(4) TYPE OF WORK: Owner's number of well
(if more than one)..... /

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) **DIMENSIONS:** Diameter of well 6 inches.
 Drilled 45 ft. Depth of completed well 81 ft.

(6) CONSTRUCTION DETAILS:

Facing installed: 4 " " " " " " 40 "

Threaded ☐ _____" Diam. from _____ ft. to _____ ft.
Welded ☒ _____" Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....

SIZE of perforations in. by in.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft. ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name.....
Type: HP

(8) **WATER LEVELS:** Land-surface elevation above mean sea level _____ ft.
 Static level 2 1/2 _____ ft. below top of well Date 4-3-74
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom?.....

Yield: 35 gal./min. with ft. drawdown after hrs.

Assumed with air

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
.....
.....

Date of test _____
 or test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Median flow _____ g.p.m. Date _____

Temperature of water..... Was a chemical analysis made? Yes ☐ No ☒

Work started 4-2, 1974. Completed 4-3, 1974

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Orchard Air Conditioning, Inc.
(Person, firm, or corporation) (Type or print)

Address 2202 River Rd Oakwood

[Signed] Chesley Marshwood
(Well Driller)

License No. 0112 Date 4-2 1917

(1) OWNER: Name (b)(6)

(b)(6)

(1) OWNER: Name

Address

(2) LOCATION OF WELL: County VANIMA

NW 1/4 Sec 34 T. 13 N., R. 18 W. M.

bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well
(if more than one)

New well	<input checked="" type="checkbox"/>	Method: Dug	<input type="checkbox"/>	Bored	<input type="checkbox"/>
Deepened	<input type="checkbox"/>	Cable	<input type="checkbox"/>	Driven	<input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Rotary	<input checked="" type="checkbox"/>	Jettied	<input type="checkbox"/>

(5) DIMENSIONS: Diameter of well 6 1/2 inches.
Drilled 49 ft. Depth of completed well 115 + ft.

(6) CONSTRUCTION DETAILS:

Casing installed: _____" Diam. from _____ ft. to _____ ft.
Threaded ☐ _____" Diam. from _____ ft. to _____ ft.
Welded ☒ 6.4" Diam. from #1 ft. to 46.5 ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....

SIZE of perforations in. by in.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____ ft.
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name.....
Type: HP

(8) **WATER LEVELS:** Land-surface elevation above mean sea level... ft.
 Static level 9 ft. below top of well Date 1-30-79
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom?

Yield: gal./min. with ft. drawdown after hrs.

" AIR TEST 30 GPM "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
------	-------------	------	-------------	------	-------------

Date of test

aller test.....gal./min. with.....ft. drawdown after.....hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

[illegible]

Work started 1-29, 1929. Completed 1-31, 1929.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME CASSAL WELL DRILLING
(Person, firm, or corporation) (Type or print)

Address 1308 VUELKER, VANNA WYN

[Signed] Jerry K. Rose
(Well Driller)

License No. 0013 Date 1-31, 1979

(1) OWNER: Name _____

(b)(6)

Address

(b)(6)

LOCATION OF WELL: County 2013 to 41 st ave - NW 1/4 SW 1/4 Sec 34 T 138 R 18 WM

Bearing and distance from section or subdivision corner *Lot 7 Atkins Road add Vol 11 Pl 46 Page 1*

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well
(if more than one).....

New well	<input checked="" type="checkbox"/>	Method: Dug	<input type="checkbox"/>	Bored	<input type="checkbox"/>
Deepened	<input type="checkbox"/>	Cable	<input type="checkbox"/>	Driven	<input type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Rotary	<input type="checkbox"/>	Jetted	<input type="checkbox"/>

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 60 ft. Depth of completed well 60 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from 0 ft. to 57 ft.
 Threaded ☐ " Diam. from " ft. to " ft.
 Welded ☐ " Diam. from " ft. to " ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____

SIZE of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? _____ ft.
Material used in seal: Bentonite
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ HP _____

(8) **WATER LEVELS:** Land-surface elevation above mean sea level.....ft.
 Static levelft. below top of well Date.....
 Artesian pressurelbs. per square inch Date.....
 Artesian water is controlled by.....(Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom?.....

Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

[illegible]

Date of test _____
 Bailor test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
DIRT	0	8
BOULDERS	8	10
CLAY + BOULDERS	40	48
SAND + GRAVEL	48	60

RECEIVED

~~OCT 18 1977~~

DEPARTMENT OF ECOLOGY
CENTRAL REGIONAL OFFICE

Work started _____, 19____. Completed _____, 19____.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME HORION DRILLING
(Person, firm, or corporation) (Type or print)

Address KIND WASH

[Signed] _____
(Well Driller)

License No. 206 Date 9-17, 1971

WATER WELL REPORT

STATE OF WASHINGTON

Application No. _____

Permit No. _____

(1) OWNER: Name (b)(6)

Address (b)(6)

(2) LOCATION OF WELL: County YAKIMA

NW 1/4 SW 1/4 Sec. 34 T. 13 N. R. 18 W. M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 5 inches.
Drilled _____ ft. Depth of completed well 90 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 5 " Diam. from 0 ft. to 51 ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.
Welded ☒ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level APP. 1100 ft.
Static level 10 ft. below top of well Date 11-7-79
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: 20 gal./min. with _____ ft. drawdown after _____ hrs.
" WITH AIR. " " "

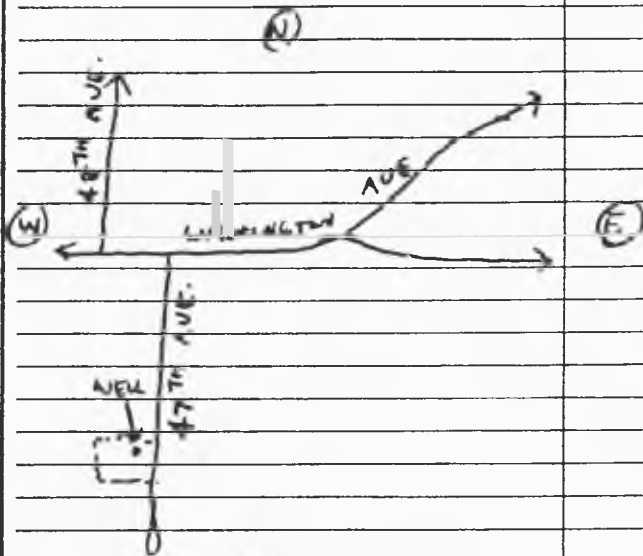
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
Date of test _____					
after test _____ gal./min. with _____ ft. drawdown after _____ hrs.					
Artesian flow _____ g.p.m. Date _____					
Temperature of water <u>56</u> Was a chemical analysis made? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOP SOIL (MEDIUM)	EASY	0
CONGLOMERATE	HARD	6
SANDSTONE	EASY	85
		90



Work started 11-1, 1979. Completed 11-7, 1979

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JENSEN'S WELL DRILLING & DRILL
(Person, firm, or corporation) (Type or print)

Address 1603 50. 10TH AVE.

[Signed] Chris B. Jensen
(Well Driller)

License No. 0217 Date 11-19, 1979

bearing and distance from section or subdivision corner

License No. 0218 Date 6-23 1976

(USE ADDITIONAL SHEETS IF NECESSARY)

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name (b)(6) Address (b)(6)
(2) LOCATION OF WELL: County YAKIMA - NE 1/4 SW 1/4 Sec 34 T13 N. R18 W.M.
bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☒
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 2 inches.
Drilled ft. Depth of completed well 21 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 2 " Diam. from 0 ft. to 21 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒

Type of perforator used
SIZE of perforations in. by in.
..... perforations from ft. to ft.
..... perforations from ft. to ft.
..... perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name
Type Model No
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 6' ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation APP 1080 ft.
above mean sea level.
Static level 6'6" ft. below top of well Date 6-21-76
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: 10 gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Packer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 52° Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOP SOIL	0	5
CONGLOMERATE	5	21

DRIVEN
WELL

RECEIVED

JUL 13 1976

DEPARTMENT OF ECOLOGY
CENTRAL REGIONAL OFFICE

Work started 6-21, 1976. Completed 6-21, 1976.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JENSEN'S WELL DRILLING
(Person, firm, or corporation) (Type or print)

Address 1603 SO. 10TH AVE.

[Signed] Lawrence Jensen
(Well Driller)

License No. 0218 Date 6-23, 1976

(1) OWNER: Name: (b)(6) Address: (b)(6) 9A

(2) LOCATION OF WELL: County YAKIMA - NE 1/4 SW 1/4 Sec 34 T 13 N. R. 18 E W M

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well
(if more than one).....

New well	<input checked="" type="checkbox"/>	Method: Dug	<input type="checkbox"/>	Bored	<input type="checkbox"/>
Deepened	<input type="checkbox"/>	Cable	<input type="checkbox"/>	Driven	<input checked="" type="checkbox"/>
Reconditioned	<input type="checkbox"/>	Rotary	<input type="checkbox"/>	Jetted	<input type="checkbox"/>

(5) **DIMENSIONS:** Diameter of well 2 inches.
 Drilled ft. Depth of completed well 20 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 2 " Diam. from 0 ft. to 20 ft.
 Threaded ☐ " Diam. from _____ ft. to _____ ft.
 Welded ☒ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....

SIZE of perforations in. by in.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

..... perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name.....

Type..... Model No.....

Diam. Slot size from ft. to ft.

Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 6 ft.
Material used in seal: BENTONITE, CEMENT GROUT.
 Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ **Depth of strata** _____
Method of sealing strata on _____

(7) PUMP: Manufacturer's Name.....
Type: HP

(8) **WATER LEVELS:** Land-surface elevation above mean sea level 168.0 ft.
 Static level 7' ft. below top of well Date 6-22-76
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☒ If yes, by whom?

Yield: 10 gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
------	-------------	------	-------------	------	-------------

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water 52° Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOP SOIL	0	10
CONGLOMERATE	10	24

DRIVEN WELL

RECEIVED

JUL 13 1976

DEPARTMENT OF ECOLOGY
CENTRAL REGIONAL OFFICE

Work started 6-22, 1974. Completed 6-22, 1974.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JENSENS WELL DRILLING / DRIVING
(Person, firm, or corporation) (Type or print)

Address 1603 So. 10th Ave.

[Signed] Source Jensen

License No. 0218 Date 6-23, 1974

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name (b)(6) Address (b)(6) Yakima

(2) LOCATION OF WELL: County YAKIMA NE 1/4 SW Sec 34 T 13 N. R 18 W.M.

Range and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well 1
(if more than one).....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 118 ft. Depth of completed well 118 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: " Diam. from ft. to ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ 6 " Diam. from 0 ft. to 98 ft.

Perforations: Yes ☐ No ☒

Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☐ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.

Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☒ No ☐
Type of water? SILTY Depth of strata 49
Method of sealing strata off cased

(7) PUMP: Manufacturer's Name GRUNDFOSS
Type: SUB HP 3/4

(8) WATER LEVELS: Land-surface elevation 1100 ft.
above mean sea level....
Static level 10 ft. below top of well Date 1/27/84
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: 20 gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Time of test
test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOP SOIL	0	2
SILT GRVL WATER DIRTY	2	18
sand & grvl dirty water silt	18	49
xxxxCEMENT GRVL.	49	71
BRN CLAY & GRVL.....	71	75
SAND & GRV	75	83
CLAY GRVL SANDSTONE.	83	85
CEMENT GRVL WATER 5-10 GPM	85	110
HARD COURSE SANDSTONE WATER	110	120

WELL PRODUCED 25 GPM BY AIR LIFT.

WELL TURNED INTO ARTESIAN
2/2/84 Low volume

DISPATCHED
FEB - 8 1984
WELL LOG

Work started 1/27/84, 19 Completed 1/27/84, 19

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME RIEBE WELL DRILLING (BOB BRITTON)
(Person, firm, or corporation) (Type or print)

Address 1503 E. Nob Hill YAKIMA

[Signed] John A. Riebe
(Well Driller)

License No. 0422 Date 1/27/84, 19

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name (b)(6)

Address

LOCATION OF WELL: County Yakima

NW 1/4 Sec 34 T13 N. R18 W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one).....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 10 inches.
Depth of completed well 751 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 10 " Diam. from 2 ft. to 751 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.

Perforations: Yes ☒ No ☐
Type of perforator used STAR
SIZE of perforations 1/4 in. by 1/4 in.
2000 perforations from ft. to ft.
675 perforations from ft. to 740 ft.
..... perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name.....
Type..... Model No.....
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:.....
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 80 + ft.
Material used in seal Bentonite-Cement
Did any strata contain unusable water? Yes ☐ No ☐
Type of water?..... Depth of strata.....
Method of sealing strata off.....

(7) PUMP: Manufacturer's Name.....
Type:..... HP.....

(8) WATER LEVELS: Land-surface elevation above mean sea level..... ft.
Static level Flow ft. below top of well Date 5/5/82
Artesian pressure 9 lbs. per square inch Date 5/5/82
Artesian water is controlled by Cap, Valve, etc.

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom CASSEL
Yield: gal./min. with ft. drawdown after hrs.
" 700+ " 95 " 3 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test.....
Ball test..... gal./min. with ft. drawdown after hrs.
Artesian flow 400 g.p.m. Date 5/5/82
Temperature of water..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOP SOIL w/ some gravel	0	10
CONGLOMERATE, GR. & CLAY	10	150
SAND & GRAVEL, G/CLAY SILT	150	170
CLAY, SANDY, w/ GRAVEL	170	340
SANDY CLAY, TAN, w/ GRAVEL	340	355
STATIC 401	34	355
CONGLOMERATE w/ GRAVEL	355	360
CLAY LENSES	355	360
CONGLOMERATE, SANDY	360	377
TAN w/ GRAVEL	360	377
CLAY, SANDY, TAN, w/ GR.	377	390
CLAY, TAN, SAND, w/ GR.	390	400
CLAY, TAN, SILT, SANDY	400	415
CLAY, STICKY, TAN	415	425
CLAY, GR. w/ GRAVEL	405	438
CLAY, GR. DATA w/ LARGE GR.	432	450
CLAY, TAN to BROWN, w/ GRAVEL	450	460
CONGLOMERATE, BROWN	460	465
SAND, COARSE, w/ SILT, WATER	465	470
CONGLOMERATE, SILT	470	504
SAND & GRAVEL, COARSE	504	510
FAIRLY CLEAN - WATER	504	510
SAND, COMPACTED, HEAVY	510	515
SILT	510	515
CONGLOMERATE, CLAY, TAN	515	600
SAND, COARSE - FINE, WATER	600	684
CLAY, LT. BROWN, SANDY	604	656
CLAY, MED BROWN, SILT SANDY	656	680
SAND, MED to COARSE	680	704
SILT - WATER - STATIC +	680	704
SAND, FINE, WATER	704	712
SAND, FINE - COARSE, SAND -		
STONE LENSES, w/ some		
GRAVEL - WATER STATIC +	712	740
CLAY, SANDY, TAN	740	751

Work started 2/17, 1982 Completed 4/30, 1982

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Cassel Well Drilling
(Person, firm, or corporation) (Type or print)

Address 1308 Voelker Ave, Yakima

[Signed] C. Cassel
(Well Driller)

License No. 0073 Date 5/5, 1982

MT-1082

WATER WELL REPORT

Application No

STATE OF WASHINGTON

Permit No

(1) OWNER: Name (b)(6)

Address (b)(6)

(2) LOCATION OF WELL: County Yakima

3601 W. Wash. Ave. Yakima

SE 1/4 NW 1/4 Sec. 34 T. 13 N. R. 18 W. 1

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Grilled 7.5 ft Depth of completed well 7.5 ft

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from 0 ft. to 7.5 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: HP.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 6 ft. below top of well Date 7/21/77
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
------	-------------	------	-------------	------	-------------

Date of test
Ballot test 20 gal./min. with 24 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation

MATERIAL	FROM	TO
Light Brown Dirt	0'	2'
Light Brown Dirt (Hard)	2'	2 1/2'
Brown Dirt	2 1/2'	4'
Brown Dirt & Sand (same water)	4'	24'
Brown Dirt & Gravel	24'	40'
Brown Clay & Sand	40'	60'
Gravel & Sand (Aquifer)	60'	75'

RECEIVED

AUG 3 1977

DEPARTMENT OF ECOLOGY
CENTRAL REGIONAL OFFICE

Work started 7/15/77 Completed 7/21/77

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME King Well Drilling
(Person, firm, or corporation) (Type or print)

Address Rt 2 Box 2374 Wapato, WA 98951

(Signed) Patrick M. Burton
(Well Driller)

License No. 0026 Date 7/22/77

WATER WELL REPORT

Application No.

STATE OF WASHINGTON

Permit No.

Packaging systems, inc.

(1) OWNER: Name (b)(6)

Address

(2) LOCATION OF WELL: County Yakima

ing and distance from section or subdivision corner 320'

See attached C-2

N 1/4 NE 1/4 Sec. 34 T 13 N. R. 18 W.M. L

(3) PROPOSED USE: Domestic ☒ Industrial ☒ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☐ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 117 ft. Depth of completed well 117 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 101 ft. to ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ 6 " Diam. from +30" ft. to 98 1/2 ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....
SIZE of perforations in. by in.
..... perforations from ft. to ft.
..... perforations from ft. to ft.
..... perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name.....
Type..... Model No.....
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:.....
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 38 ft.
Material used in seal CEMENT & BENTONITE
Did any strata contain unusable water? Yes ☒ No ☐
Type of water? surface Depth of strata 3
Method of sealing strata off case & cemented

(7) PUMP: Manufacturer's Name Seare
Type: Shallow well HP. 1/2

(8) WATER LEVELS: Land-surface elevation 1030
above mean sea level....
Static level +30" ft. below top of well Date 10-19-73
Artesian pressure lbs. per square inch Date.....
Artesian water is controlled by CAP
(Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?.....
Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test.....
Pump test..... gal./min. with ft. drawdown after hrs.
Artesian flow..... g.p.m. Date.....
Temperature of water..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOP SOIL (FINE SILTY)	0	12
cement gravel (sur.water)	12	18
Dec. Rock, Bldrs. Sand Gravel	18	38
Dec. Rock & Bldrs.	38	114
Dec. Rock, Sand, Gravel Water	114	117

Well Produced in excess of 50 GPM @ 116'

Static Water Level +30"

Casing all told inc. shoe 101' new 1/4 wall

Cemented to 38' clay above that

Work started 10-18-73, 19..... Completed 10-19-73, 19.....

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Riebe Well Drilling, 1503 E. Nob Hill
(Person, firm, or corporation) (Type or print)

Address Yakima, Washington

[Signed] John C. Riebe
(Well Driller)

License No. 3601 Date 10-26-73, 19.....

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name Calvary Cemetery Address 1405 S. 24th Ave., Yakima WA 98902
LOCATION OF WELL: County YAKIMA — SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec 26 T 13 N. R. 18E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 132 ft. Depth of completed well 0 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from 0 ft. to 89 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: HP

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 20 ft. below top of well Date 9/21/86
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: 100+ gal./min. with ft. drawdown after hrs.
" ESTIMATED AIRLIFT PRIOR TO "
" ABANDONMENT "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
------	-------------	------	-------------	------	-------------

Date of test

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

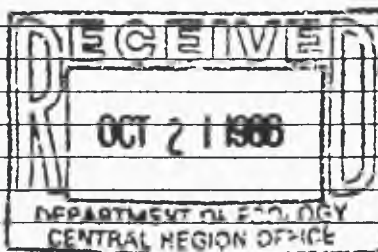
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Clay, brown, moist	0	20
Cemented sand & gravel w/water	20	132

NOTE: Abandoned hole with two yards of cement and bentonite

NO PVC Liner Installed

8" Drive shoe utilized



Work started 9/20, 19 86 Completed 9/21, 19 86

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME PONDEROSA DRILLING & DEVELOPMENT INC.
(Person, firm, or corporation) (Type or print)

Address E. 6010 Broadway, Spokane WA 99212

[Signed] W. Joseph Close Jr. (Well Driller)

License No. 1040 Date 9/21, 19 86

WATER WELL REPORT

STATE OF WASHINGTON

Application No. 98902

Permit No. 9

(1) OWNER: Name Calvary Cemetery Address 1405 S. 24th Ave., Yakima WA 98902
LOCATION OF WELL: County YAKIMA SW 1/4 SE 1/4 Sec 26 T 13 N. R. 18E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well 2
(if more than one) New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 10 inches.
Drilled 205 ft. Depth of completed well 190 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 10 " Diam. from +1 ft. to 55 ft.
Threaded ☐ 8 " Diam. from +1 ft. to 175 ft.
Welded ☒ 7 " Diam. from 168 ft. to 170 ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☒ No ☐

Manufacturer's Name Johnson
Type stainless steel Model No. _____
Diam. 7 Slot size 20 from 170 ft. to 180 ft.
Diam. 7 Slot size 10 from 180 ft. to 190 ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation _____ ft.
above mean sea level. Static level 20 ft. below top of well Date 9/30/86
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: 200+ gal./min. with _____ ft. drawdown after _____ hrs.
" ESTIMATED AIRLIFT " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
------	-------------	------	-------------	------	-------------

Date of test _____

Ballor test _____ gal./min. with _____ ft. drawdown after _____ hrs.

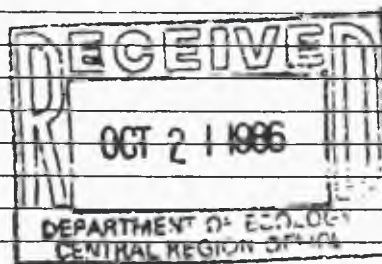
Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Clay, brown, moist	0	20
Cemented sand & gravel w/cobble w/water	20	135
Shale, soft	135	160
Shale, broken w/clay & sandstone w/water	160	170
Shale, medium hard	170	180
Shale, broken w/clay & sandstone w/water	180	190
Shale, broken w/sand w/water	190	205
No PVC Liner installed		
10" Drive shoe utilized		
8" Drive shoe utilized		



Work started 9/23, 1986. Completed 9/30, 1986.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME PONDEROSA DRILLING & DEVELOPMENT INC.
(Person, firm, or corporation) (Type or print)

Address E. 6010 Broadway, Spokane, WA 99212

(Signed) W. Joseph Close Jr. (Well Driller)

License No. 1040 Date 9/30, 1986

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name (b)(6) Address (b)(6)
(2) LOCATION OF WELL: County Yakima (West Valley area) 1/4 SW 1/4 Sec. 26 N. 13 E. 18 W. M
Bearing and distance from section or subdivision corner N

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one).....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 57 ft. Depth of completed well 57 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from +2 ft. to 57 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used.....
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name.....
Type..... Model No.....
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:.....
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water?..... Depth of strata.....
Method of sealing strata off.....

(7) PUMP: Manufacturer's Name.....
Type:..... HP.....

(8) WATER LEVELS: Land-surface elevation above mean sea level..... ft.
Static level 24'6" ft. below top of well Date.....
Artesian pressure lbs. per square inch Date.....
Artesian water is controlled by..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?.....
Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test.....
Baller test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date.....
Temperature of water..... Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top soil	brn	M 0 4
Very Large boulders	blk VVH	4 6
Very Large boulders	blk VVH	6 17
Boulders gravel clay	VH	17 21
Boulders gravel sand	H to VH	21 40
Boulders gravel sand	H to VH	40 57

Work started 2-17-85, 19..... Completed 2-20-85, 19.....

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Riebe Well Drilling
(Person, firm, or corporation) (Type or print)

Address 1503 E. Nob Hill Blvd.

[Signed] John H. Riebe
(Well Driller)

License No. 0422 Date 2/25/85, 19.....

WATER WELL REPORT

Application No.

STATE OF WASHINGTON

Permit No.

(1) OWNER: Name

(b)(6)

Address

(b)(6)

Yakima 11/01

(2) LOCATION OF WELL: County

Yakima

71 E. 1/4 SW. 1/4 Sec. 27 T. 13 N. R. 18 W.M.

Bearing and distance from section or subdivision corner

SE 164' of W. 168' of N. 243.1' of S 807.1'

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 6.5 ft. Depth of completed well 6.5 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: ☒ Diam. from 0 ft. to 4.0 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 38 ft.

Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____

Type: _____ H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 11 1/2 ft. below top of well Date 29-11-74

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____

Yield: 75 gal./min. with _____ ft. drawdown after _____ hrs.

" Pumped with Air "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil	0	4
Hardpan & gravel layer	4	34
Sandstone & clay layers	34	51
Sandstone & gravel layers	51	65
With Water	51	65

RECEIVED

Work started 29-11-74 Completed 29-11-74

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Eastwood Drilling Inc
(Person, firm, or corporation) (Type or print)

Address 2202 River Rd Yakima Wn

[Signed] Chester Eastwood
(Well Driller)

License No. 0112 Date 29-11-74

WATER WELL REPORT

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name (b)(6) Address (b)(6) Yakima
LOCATION OF WELL: County Yakima NW 1/4 Sec 27 T13 N. R. 18 W.M.
Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one).....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 140 ft. Depth of completed well 140 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from +1 ft. to 119 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒

Type of perforator used.....
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒

Manufacturer's Name.....
Type..... Model No.....
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:.....
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20+ ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water?..... Depth of strata.....
Method of sealing strata off.....

(7) PUMP: Manufacturer's Name.....
Type:..... HP.....

(8) WATER LEVELS: Land-surface elevation above mean sea level..... ft.
Static level 56 ft. below top of well Date 10/28/85
Artesian pressure lbs. per square inch Date.....
Artesian water is controlled by..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom?.....
Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

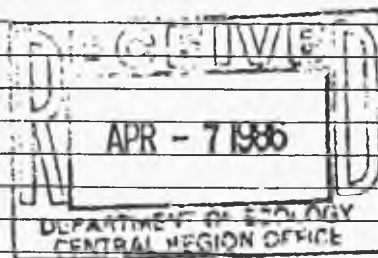
Time	Water Level	Time	Water Level	Time	Water Level
------	-------------	------	-------------	------	-------------

Date of test.....
Bailer test 75 gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date.....
Temperature of water..... Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Topsoil	0	6
Gravel, Brown clay, & sandstone	6	132
Sandstone & water	132	140



Work started 10/24/85, 19..... Completed 10/28/85, 19.....

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Vernon L. Rank
(Person, firm, or corporation) (Type or print)

Address 5503 Ahtanum Rd. Yakima, Wa. 98903

[Signed] Vernon L. Rank
(Well Driller)

License No. 0854 Date 10/30/85 19.....

WATER WELL REPORT

STATE OF WASHINGTON

Application No. G 3-20651

Permit No. G 3-20651 P

(1) OWNER: Name City of Yakima Address 129 N. 2nd St., Yakima, Wa, 98901

(2) LOCATION OF WELL: County Yakima — SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 27 T. 13 N. R. 18 W. M. A
and distance from section or subdivision corner N. 50° W 320' from SE cor. SW $\frac{1}{4}$ SW $\frac{1}{4}$

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 332 ft. Depth of completed well 332 ft.

(6) CONSTRUCTION DETAILS

Casing installed: 12 " Diam. from 0 ft. to 50 ft.
Threaded ☐ 8 " Diam. from +2 ft. to 332 ft.
Welded ☒ " Diam. from " ft. to " ft.

Perforations: Yes ☒ No ☐
Type of perforator used star
SIZE of perforations $\frac{1}{4}$ in. by $1\frac{1}{4}$ in.
2400 perforations from " ft. to " ft.
245 perforations from " ft. to 330 ft.
perforations from " ft. to " ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 56 ft.
Material used in seal Neat cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name Tait
Type: Verticle Turbine HP. 60

(8) WATER LEVELS: Land-surface elevation 1765 ft.
above mean sea level. Date 9/26/73
Static level 18 ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom Fosseens
Field: 600 gal./min. with 60 ft. drawdown after 6 hrs.
" 500 " 62 " 10 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level
2:00 80 2:01 30 2:05 25

of test 9/13/73
Packer test 80 gal./min. with 12 ft. drawdown after 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water 53 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
top soil tan	0	3
Conglomerate gravel & boulders firm	3	73
" gravel & sand med. soft	73	80
Sand gray loose med. to fine	80	82
Conglomerate gray firm	82	100
Sandstone with gravel & silt Med soft	100	106
Conglomerate tan med. firm	106	115
" gray hard	115	129
" gravel & sand silt brown soft	129	145
" tan hard	145	147
" Sand & gravel silted m. soft	147	202
" coarse tan heavy silt	202	215
" clay sand s. gravel soft	215	219
" tan firm	219	220
" gravel & sand-clay interbedded	220	241
" tan hard	241	246
" tan firm-narrow soft strata	246	262
Clay tan with small gravel & sand	262	271
Compacted small gravel-sand-silt		
light brown-good water	271	280
Clay-tan-some gravel-sand soft	280	286
Conglomerate tan (light) med. firm	286	305
Compacted sand-small gravel tan		
light silt (water)	305	312
Compact gravel-sand-heavy silt		
tan (water)	312	324
Compact sand-coarse-brown(water)	324	331
Clay with sand-tight	331	332

Major aquifers at 271ft to 280ft
305ft to 331ft
Other noticeable lesser aquifers
80ft. to 82ft. 100ft. to 106ft.
Possible other unnoticeable narrow lenses

Work started 7/16 1973 Completed 9/26 1973

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Cassel Well Drilling
(Person, firm, or corporation) (Type or print)

Address 1308 Voelker Yakima, Wn. 98902

[Signed] Jerry R. Cassel
(Well Driller)

License No. 0075 Date 9/26/73 1973

WATER WELL REPORT

Application No. 1

STATE OF WASHINGTON

Permit No.

(1) OWNER: Name (b)(6)

Address (b)(6)

(2) LOCATION OF WELL: County Yakima, SW 1/4 SE 1/4 Sec. 27 T.13 N. R. 18 W.M.
and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 5 inches.
Drilled _____ ft. Depth of completed well 58 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 5" Diam. from 0 ft. to 28 ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.
Welded ☒ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒

Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation app. 1100 ft.
above mean sea level.
Static level 7' 4" ft. below top of well Date 2-12-81
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: 20 gal./min. with _____ ft. drawdown after _____ hrs.
" with air " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

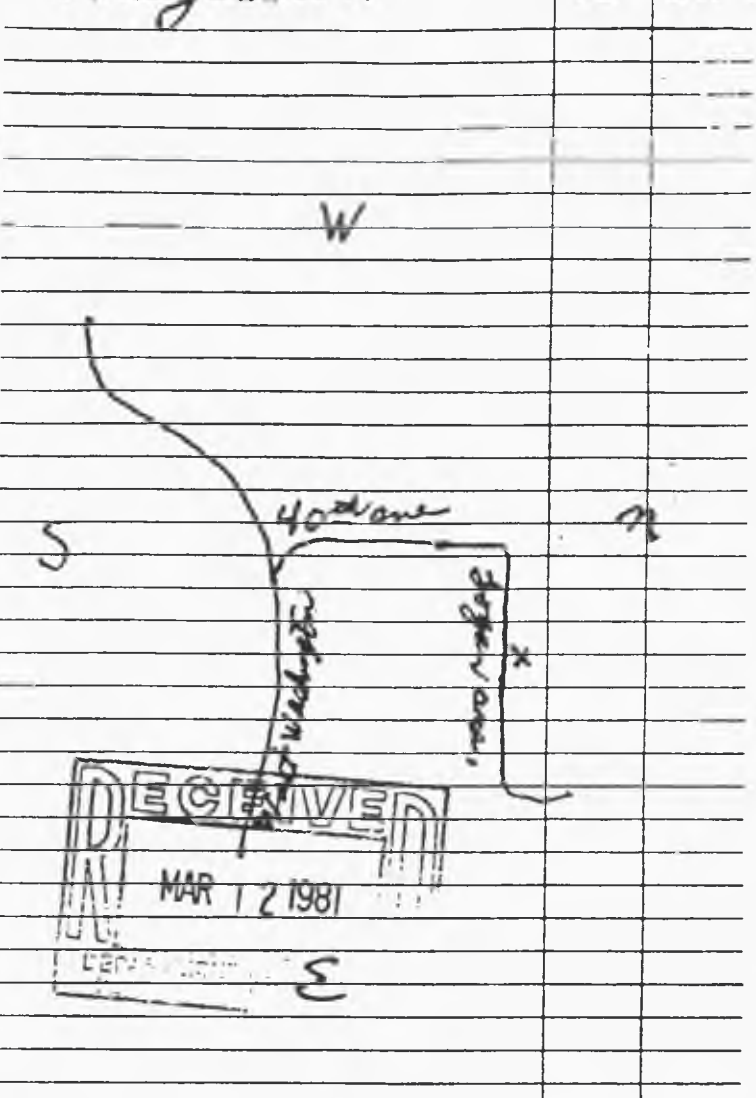
Time	Water Level	Time	Water Level	Time	Water Level

of test _____
Ballot test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water 56 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil	0	10
Coarse Gravel	10	58



Work started 2-12-81 Completed 2-12-81

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JENSEN'S WELL DRILLING + DRIVING
(Person, firm, or corporation) (Type or print)

Address 1603 So. 10th AVE. YAKIMA, WASH.

[Signed] Chris B. Jensen Jr.
(Well Driller)

License No. 0217 Date 3-12-81

APPENDIX C

RESULTS OF SEPTIC TANK/DRAIN FIELD SYSTEM
SOIL AND WATER CHARACTERIZATION STUDY

OFFICIAL USE ONLY
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WESTERN REGION

Yakima Agricultural Research Laboratory
3706 West Nob Hill Boulevard
Yakima, Washington 98902

REPORT OF RESIDUE ANALYSIS

PCY-83-9

Project : Machinery Washing Pad, USDA/ARS - Septic tank and
drainage areas.

Date : July 29, 1983

Sample : Soil and water
Chlorinated hydrocarbon and Organophosphate
pesticides

Origin : J. E. Halfhill
USDA, ARS
3706 W. Nob Hill Boulevard
Yakima, WA 98902

Analyst : Jay C. Maitlen *JCM*

Supervisor : L. M. McDonough *LM*

SUMMARY

Samples of soil and water were taken from areas associated with an equipment washing pad, located on the premises of the USDA, ARS, Yakima Agricultural Research Laboratory, 3706 W. Nob Hill Blvd., Yakima, WA. Samples included water taken from the septic tank associated with the wash pad, and soil taken from the connected drain field and from an area near and below the level of the drain field. The samples were analyzed for residues of the following chlorinated hydrocarbon pesticides: aldrin, BHC, DDT-op', DDT-pp', TDE, dieldrin, 2,4-D, endrin, heptachlor, heptachlor epoxide, lindane and methoxychlor and for residues of the following organophosphate pesticides: demeton and its metabolites, fensulfthion and its metabolites, Guthion, oxydemetonmethyl and its metabolites, parathion and paraoxon.

Of the samples analyzed, only the soil sample from the drain field was found to contain possible pesticide residues. This sample contained apparent residues of 0.05 ppm of Lindane and 0.10 ppm of DDT-pp'. No detectable residues (<0.05 ppm) of the other above listed chlorinated hydrocarbon or organophosphate pesticides were found in this sample.

The water sample from the septic tank and the soil sample from near and below the level of the drain field contained no detectable residues (<0.05 ppm) of any of the above listed chlorinated hydrocarbon or organophosphate pesticides.

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SAMPLE DESCRIPTION AND SAMPLING PROCEDURE

On March 3, 1983 samples of soil and water were taken from the septic tank, the drain field and the adjacent drainage area that was associated with an equipment wash down pad located at the USDA, ARS, Yakima Agricultural Research Laboratory, 3706 W. Nob Hill Boulevard, Yakima, WA. The soil samples were 6 inch diameter cores taken from below the soil surface and the water samples was dipped from the septic tank. The samples taken were as follows:

Sample No.	Laboratory Analytical No.	Sample description
C-4	4684 4701* ¹	Soil - Non-contaminated control sample
B-1	4686 4702*	Soil - From drain field associated with wash pad from the 2 ft. level.
B-2	4681 4703*	Soil - From near and below the level of the wash pad drain field at the 6.5 ft. level.
W-1	4695 4700*	Water - Non-contaminated control sample
W-2	4688 4704*	Water - From the septic tank associated with the wash pad.

¹ Numbers marked with an asterisk were analyzed for organophosphate pesticide residues, all others were analyzed for chlorinated hydrocarbon pesticide residues.

ANALYTICAL PROCEDURES

The previously described samples were analyzed for residues of the following chlorinated hydrocarbon pesticides: aldrin, BHC (benzenehexachloride), DDT-op¹, DDT-pp¹, TDE (metabolite of DDT), dieldrin, 2,4-D, endrin, heptachlor, heptachlor epoxide, lindane and methoxychlor. Similar samples were analyzed for residues of the following organophosphate pesticides: demeton and its metabolites, fensulfothion and its metabolites, Guthion, oxydemetonmethyl and its metabolites, parathion and paraoxon. The pesticide residue extraction, cleanup and GLC analysis procedures are described in the following pages of this report.

Extraction Procedures:

Soil-chlorinated hydrocarbon residues: Fifty (50) grams of each sample were weighed into a 500 mL Erlenmeyer® flask, 150 mL of a 2-1 solvent mixture of hexane and isopropyl alcohol added and the solution was then shaken on a wrist-action shaker for 1 hour. The extract solution was then filtered through a fluted filter paper into a 250 mL separatory funnel. The solution in the separatory funnel was then extracted 4 times each with 100 mL of water to remove the isopropyl alcohol. The hexane solution was then filtered through a funnel plugged with cotton overlaid with anhydrous sodium sulfate (Na_2SO_4) into a bottle and the resultant extract was stored in a refrigerator until analyzed.

Soil-organophosphate residues: Fifty (50) grams of each soil sample was weighed into a quart Warning® blender jar, 200 mL of dichloromethane (MeCl_2) added and the solution then blended for 4 min. at high speed. The extract solution was filtered through a fluted filter paper into a 250 mL separatory funnel. The solution in the separatory funnel was then slowly filtered through a funnel plugged with cotton overlaid with Na_2SO_2 into a bottle and the extract stored in a refrigerator until analyzed.

Water-chlorinated hydrocarbon residues: Fifty (50) grams of the water sample was weighed into a 500 mL Erlenmeyer flask, 100 mL of hexane added and the solution then shaken for 1 hour on a wrist-action shaker. The extract solution was then poured into a 250 mL separatory funnel and the lower water layer was drawn off and discarded. The hexane was then filtered through a funnel plugged with cotton overlaid with Na_2SO_4 into a bottle and stored in a refrigerator until analyzed.

Water-organophosphate residues: Fifty (50) grams of the water sample was weighed into a 500 mL Erlenmeyer flask, 100 mL of MeCl_2 added and then the solution was shaken on a wrist-action shaker for 1 hour. The extract solution was then poured into a 250 mL separatory funnel and the lower MeCl_2 layer was slowly filtered in the same manner as the soil extract above. The filtered extract was collected in a bottle and stored in a refrigerator until analyzed.

Cleanup Procedures:

Soil and water-chlorinated hydrocarbon residues: A 10 mL portion of each soil and water extract solution (equivalent to 5 g of sample) was measured into separate 50 mL Erlenmeyer flasks and evaporated to dryness in a 45°C water bath with the aid of a gently stream of air. The resultant residue was dissolved in 5 mL of hexane, the flask stoppered and the solution stored in a refrigerator until column chromatography cleanup. A glass chromatograph column, 10 mm i.d. by 45 cm was packed from bottom to top with a plug of cotton, 1/2 inch of Na_2SO_4 , 3.0 g of silica gel and a plug of cotton. The silica gel was Bakers 5-3405 analyzed reagent grade (60-200 mesh) that had been heated overnight in a 120°C oven and then deactivated by adding 2.0% water (w/w) and then tumbling in an end-over-end manner for 1 hour. This stock silica gel was then stored in a refrigerator in a sealed glass container until needed. Prior to column chromatography cleanup, the sample solutions were removed from the refrigerator, allowed to warm to room temperature and then transferred on to the chromatography

column with 20 mL of hexane. After this solution was absorbed into the top of the column, the column wall was rinsed down with 1 mL of hexane. After this solution was absorbed into the top of the column an additional 30 mL of hexane was added and allowed to pass through the column. The collected solution from these steps of the chromatography was called fraction 1 and contains residues of aldrin, DDT-op', DDT-pp', TDE, heptachlor and lindane (40%). The collection flask was changed and 40 mL of a solvent mixture of 2.0% ethyl ether and 98.0% hexane was added. The collected solution from this step was called fraction 2 and contained residues of BHC (50%), dieldrin, heptachlor epoxide, endrin, methoxychlor and lindane (60%). The collection flask was again changed and 40 mL of solvent mixture of 5.0% ethyl ether and 95.0% hexane was added. The collected solution from this elution was called fraction 3 and contained residues of 2,4-D methyl ester and BHC (50%). The collected fractions were evaporated to dryness in the 45°C water bath, transferred to 8 mL glass vials with MeCl_2 , evaporated to dryness again and the resultant residue dissolved in 1 mL of nano-grade hexane and stored in a refrigerator until analysis by gas chromatography.

Soil and water-Organophosphate residues: A 40 mL aliquot (equivalent to 20 g of sample) of each sample extract was measured into a 50 mL Erlenmeyer flask, evaporated to dryness in the water bath and then transferred to an 8 mL glass vial with MeCl_2 . This solution was then evaporated to dryness in the water bath, the resultant residue dissolved in 1 mL of a 1-1 mixture of acetone and hexane and then stored in a refrigerator until analyzed. These samples required no further cleanup prior to analysis.

GLC Quantitation of Residues:

Soil and water-Chlorinated hydrocarbon residues: Residues of the aforementioned chlorinated hydrocarbon pesticides in the soil and water samples were quantitated with a Hewlett Packard Model 5840A gas chromatograph (GLC) equipped with a Nickel-63 α electron capture detector. The GLC column was 4.0 mm i.d. by 51 cm, glass, packed with Gas Chrom Q (81/100 mesh) coated with a 1-1 mixture of 3% OV-17 and 3% QF-1 and operated isothermally at 185°C. The carrier gas was a mixture of 5% methane and 95% argon and the flow rate was 80 mL/min.

The retention times (Rt) in minutes for the chlorinated hydrocarbon pesticides evaluated are shown in Table 1. Also, Figures 1 through 3 are sample chromatograms which show the GLC retention times of these compounds.

Soil and water-Organophosphate residues: Residues of the previously listed organophosphate pesticides in soil and water were quantitated with a Hewlett Packard Model 5840A gas chromatograph (GLC) equipped with a flame photometric detector fitted with a filter for the detection of phosphorous compounds. The glass GLC column was 4.0 mm by 61 cm and was packed with Ultra Bond Carbowax 20M + 2% OV 101 (80/100 mesh). The carrier gas was nitrogen and the flow rate was 75 mL per minute. The column oven temperature was programed from 140 to 220°C (rate 10°/min.) for the evaluation of residues of these organophosphate pesticides. Figure 4 is a sample chromatogram which shows the GLC retention times of the organophosphate pesticides involved in this work.

CONTROLS AND RECOVERIES

Controls: Non-contaminated soil and water samples were analyzed to determine if there were any compounds in these samples that would produce GLC peaks with the same retention times as the pesticides being evaluated. No interfering peaks were detected. Figures 5 through 10 demonstrate GLC chromatograms of the various liquid chromatography fractions of non-contaminated soil and water as determined by the analytical procedures used for the detection of the chlorinated hydrocarbon pesticides. Since there were no peaks found in the GLC chromatograms of the control samples of water and soil analyzed for organophosphate pesticide residues, no figures of the chromatograms are shown.

Recoveries: To determine the efficiency of the analytical procedures, control samples of soil and water were fortified with known amounts of pure chlorinated hydrocarbon and organophosphate pesticides prior to extraction and the percent recovery determined. Table 2 shows the recoveries found.

RESULTS AND DISCUSSION

Chlorinated hydrocarbon pesticide residues: As demonstrated, only soil sample B-1 was found to contain possible detectable residues of any of the aforementioned chlorinated hydrocarbon pesticides. This sample was taken from the drain field of the equipment washing pad and contained apparent residues of 0.05 ppm of Lindane and 0.10 ppm of DDT, pp'. This sample contained no detectable residues (<0.05 ppm) of the remaining previously listed chlorinated hydrocarbon pesticides.

The water sample (W-2) taken from the septic tank associated with the wash pad and the soil sample (B-2) taken from an area near and below the level of the drain field of the wash pad, contained no detectable residues (<0.05 ppm) of the previously listed chlorinated hydrocarbon pesticides. Although results in Table 1 and in Figures 14 and 15 show GLC peaks with retention times characteristic of lindane residues for the soil sample B-2, it is felt that this sample contained no residues of this compound. As demonstrated by results in Table 1 and by the GLC chromatogram Figures 1 and 2, the retention time of lindane is 0.72 min. and the ratio of the peaks in the liquid chromatographic fractions 1 and 2 is 40-60 (%). In sample B-2, the retention time of the two peaks relative to lindane was 0.79 and 0.75, but the ratio of the residues found in the liquid chromatographic fractions 1 and 2 was about 10-90 (%). Therefore this residue was considered not to be lindane.

Organophosphate pesticide residues: For the most part, organophosphate pesticides rapidly degrade in the environment in 10 to 120 days. Therefore, the soil and water samples were analyzed only for residues of the organophosphate pesticides used on the laboratory premises in the past year. As demonstrated in Figures 20 through 22 there were no detectable residues (<0.05 ppm) of the previously listed organophosphate pesticides found in soil samples B-1 and B-2 or in the water sample, W-2.

ACKNOWLEDGEMENT

We wish to thank Ms. Lisa Saxe of this laboratory for her assistance in the extraction, cleanup and analysis of these samples.

cc:

A. K. Burditt, Jr.
J. E. Halfhill

Table 1. The GLC retention times (min.) and the liquid chromatographic fraction in which peaks were found relative to pure standards of chlorinated hydrocarbon pesticides and samples of soil and water taken from an equipment washing site.

Sample	Liquid chromatographic fraction ¹		
	Fraction 1	Fraction 2	Fraction 3
<u>Pure chlorinated hydrocarbon standards</u>			
Heptachlor	0.89 ²	N ³	N
Lindane	0.72(40%) ⁴	0.72(60%)	N
Aldrin	1.10	N	N
DDT-op ¹	3.91	N	N
TDE	4.32	N	N
DDT-pp ¹	5.27	N	N
BHC	N	1.01(50%)	1.01(50%)
Heptachlor epoxide	N	1.75	N
Dieldrin	N	2.79	N
Endrin	N	3.45	N
Methoxychlor	N	10.97	N
2,4-D methyl ester	N	N	0.46
<u>Soil and Water Samples</u>			
Soil- (C-4)	N	2.13	1.41
Control-4684			
Water-(W-1)	N	1.19	N
Control-4695			
Soil-(B-1)	0.79(40%)	0.75(60%)	1.36
Drain field- 4686	5.25	2.14	
	7.72	5.17	
	10.67		
Soil-(B-2)	0.79(10%)	0.75(90%)	4.27
Near and below		4.05	7.00
drain field level-4681			
Water-(W-2)	N	2.91	0.70
Septic tank - 4688			

¹ This designates the liquid chromatographic fraction in which the GLC peaks were found.

² This number is the GLC retention time in minutes.

³ N designates that there were no GLC peaks found.

⁴ The percent values in parenthesis designates the amount of the total compound found in each liquid chromatographic fraction.

Table 2. Recoveries of chlorinated hydrocarbon and organophosphate pesticides from control samples of soil and water that were fortified with the pure compounds prior to extraction.

Pesticide added	Ppm added	Recovery found (%)	
		soil	water
<u>Chlorinated hydrocarbon pesticides</u>			
Aldrin	0.1	79.0	97.8
BHC	0.1	114.0	105.0
DDT-op'	0.1	96.0	107.0
DDT-pp'	0.1	98.0	108.0
2,4-D methyl ester	0.1	118.0	110.0
Dieldrin	0.1	106.0	111.0
Endrin	0.1	99.0	110.0
Heptachlor	0.1	134.0	135.0
Heptachlor epoxide	0.1	111.0	114.0
Lindane	0.1	130.0	113.0
Methoxychlor	0.1	131.0	100.0
TDE	0.1	98.0	97.0
<u>Organophosphate pesticides</u>			
Demeton thiono	0.1	101.0	86.0
Demeton thiol	0.1	106.0	91.0
Demeton thiol sulfoxide	0.1	101.0	87.0
Fensulfothion & combined metabolites (sulfone, oxygen analog, oxygen analog sulfone)	0.1(each)	99.0	94.0
Guthion	0.1	110.0	98.0
Oxydemetonmethyl	0.1	107.0	96.0
Oxydemetonmethyl sulfone	0.1	113.0	86.0
Parathion	0.1	101.0	92.0
Paraoxon	0.1	94.0	87.0

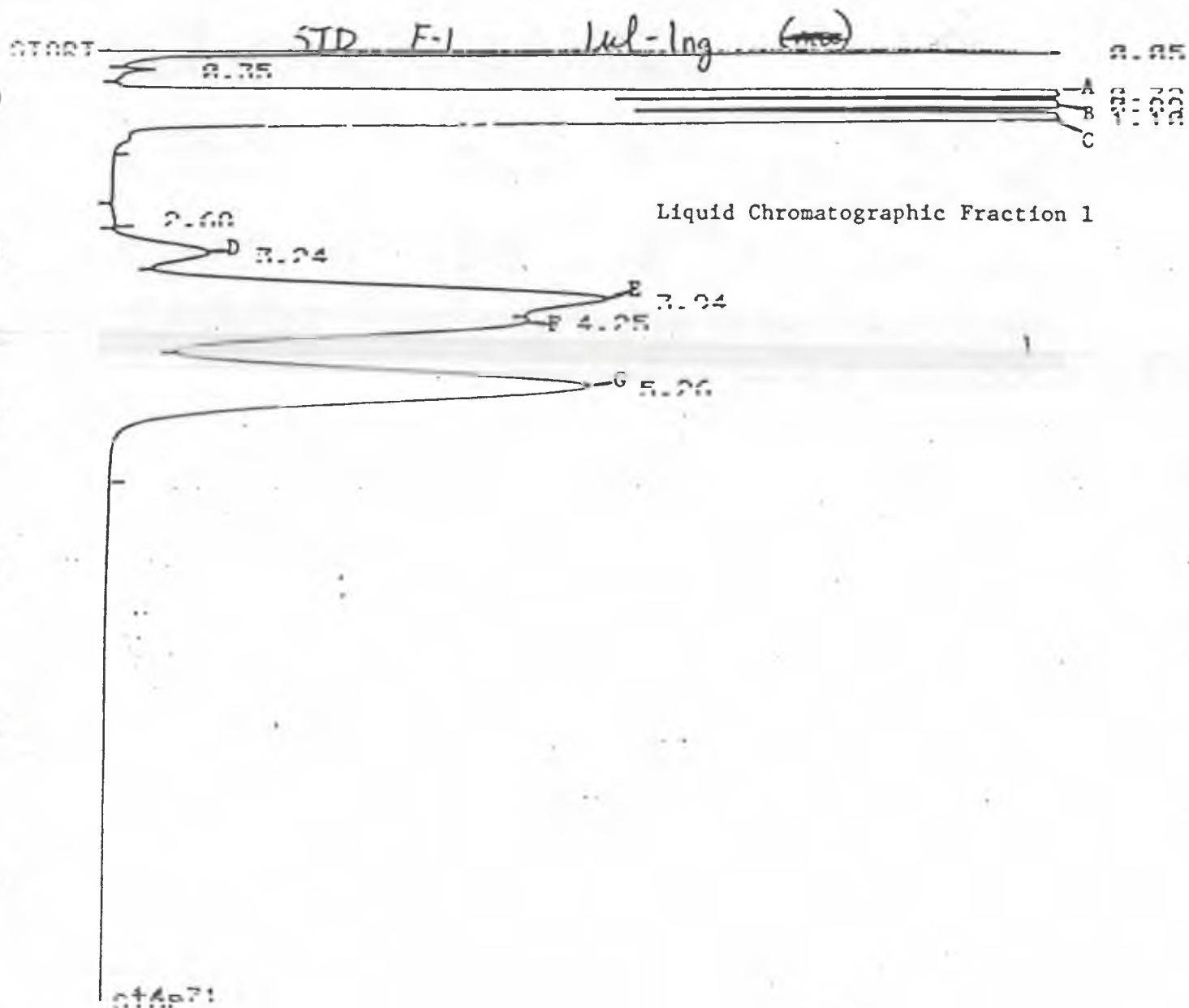


Figure 1. GLC chromatograms of 1.0ng each of pure standards of lindane (A), heptachlor (B), aldrin (C), DDE op' (E), TDE (F), and DDT pp' (G). Peak D is from an impurity found in the TDE standard.

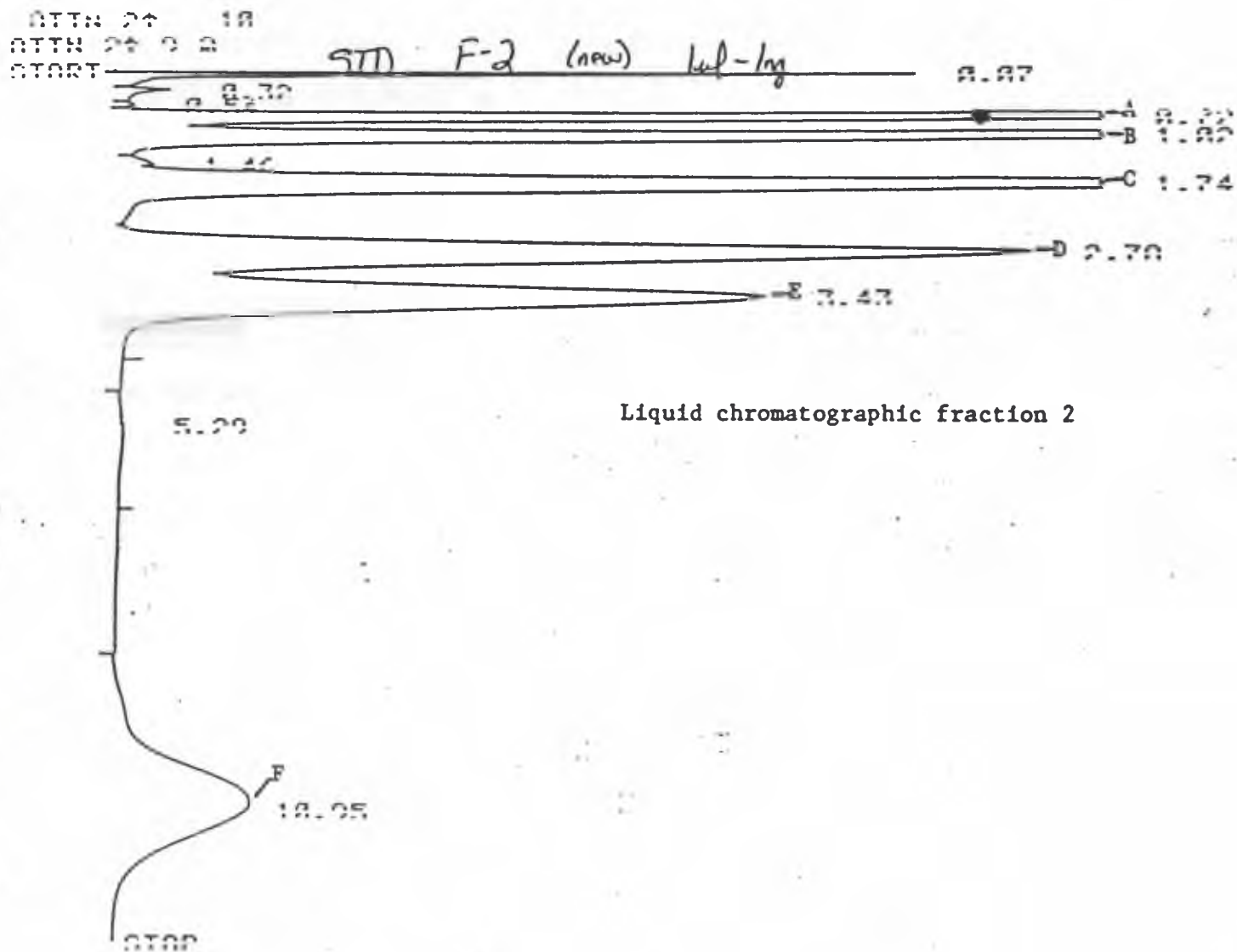


Figure 2. GLC chromatograms of 1.0ng each of pure standards of lindane (A), BHC (B), heptachlor epoxide (C), dieldrin (D), endrin (E), and methoxychlor (F).

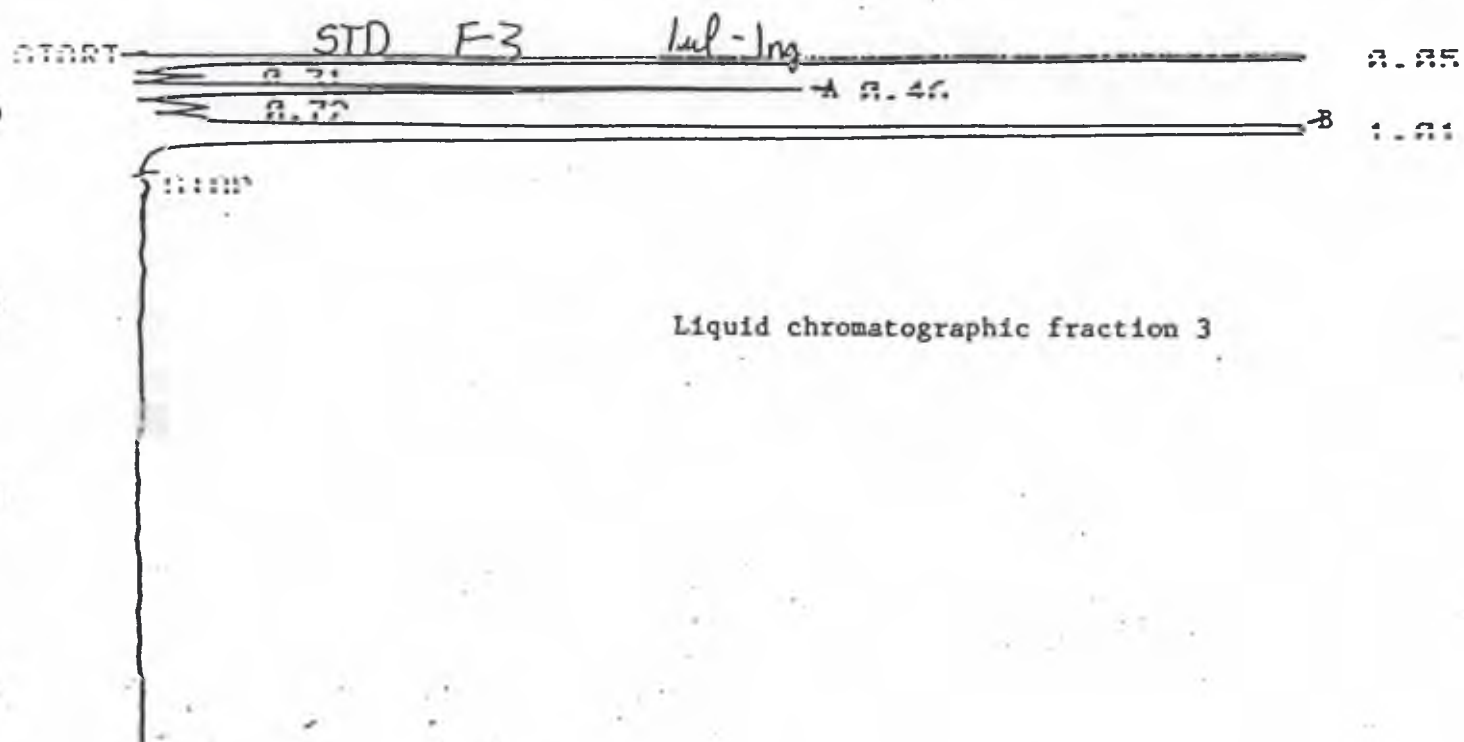


Figure 3. GLC chromatograms of 1.0 ng each of pure standards of 2,4-D methyl ester (A) and BHC (B).

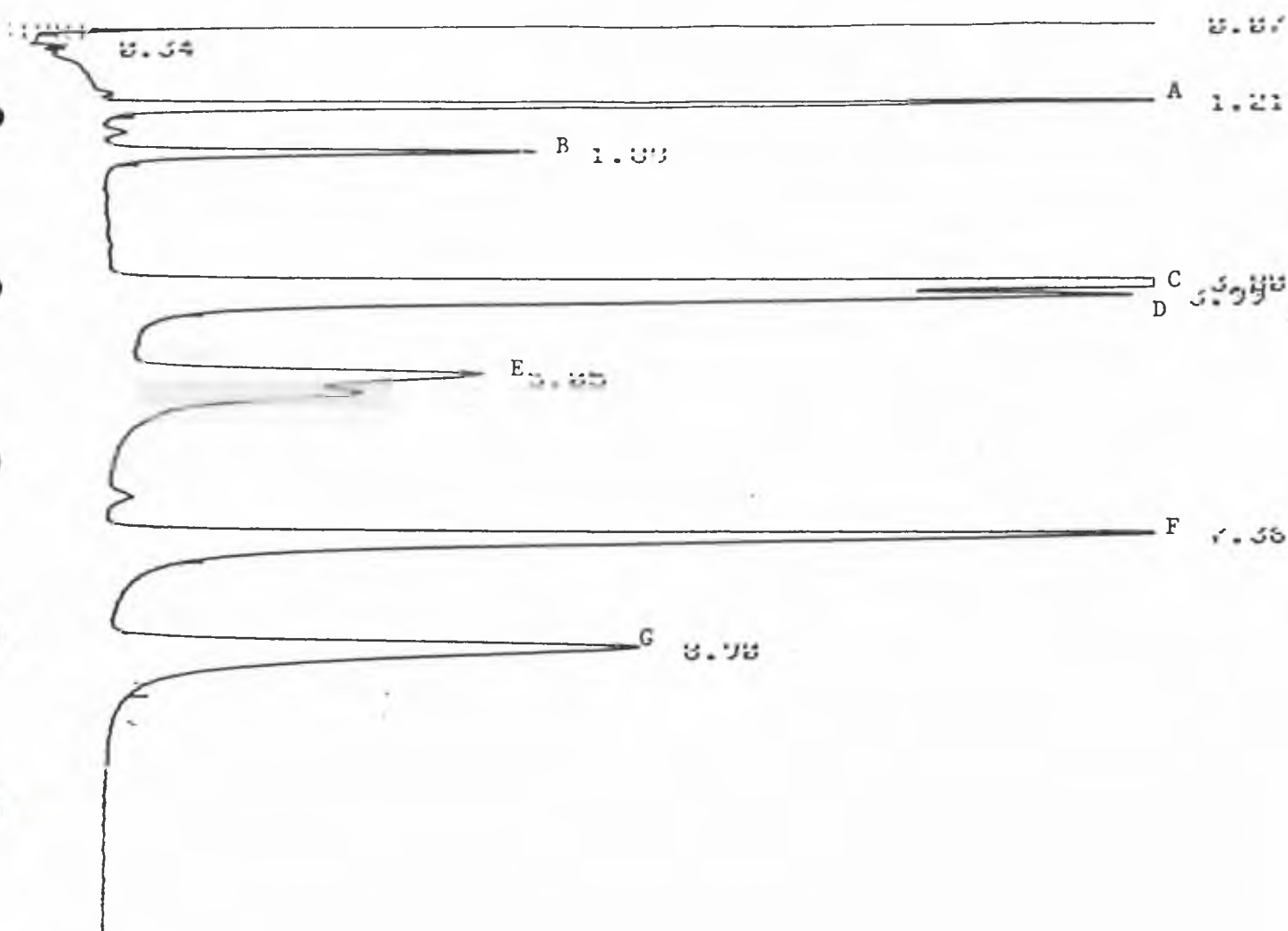


Figure 4. GLC chromatogram of 5.0ng each of pure standards of demeton thiono (A), demeton thiol (B), paraoxon (C), parathion (D), demeton thiol sulfoxide (E), fensulfothion and its combined metabolites of sulfone, oxygen analog and oxygen analog sulfone (F), and Guthion (G).

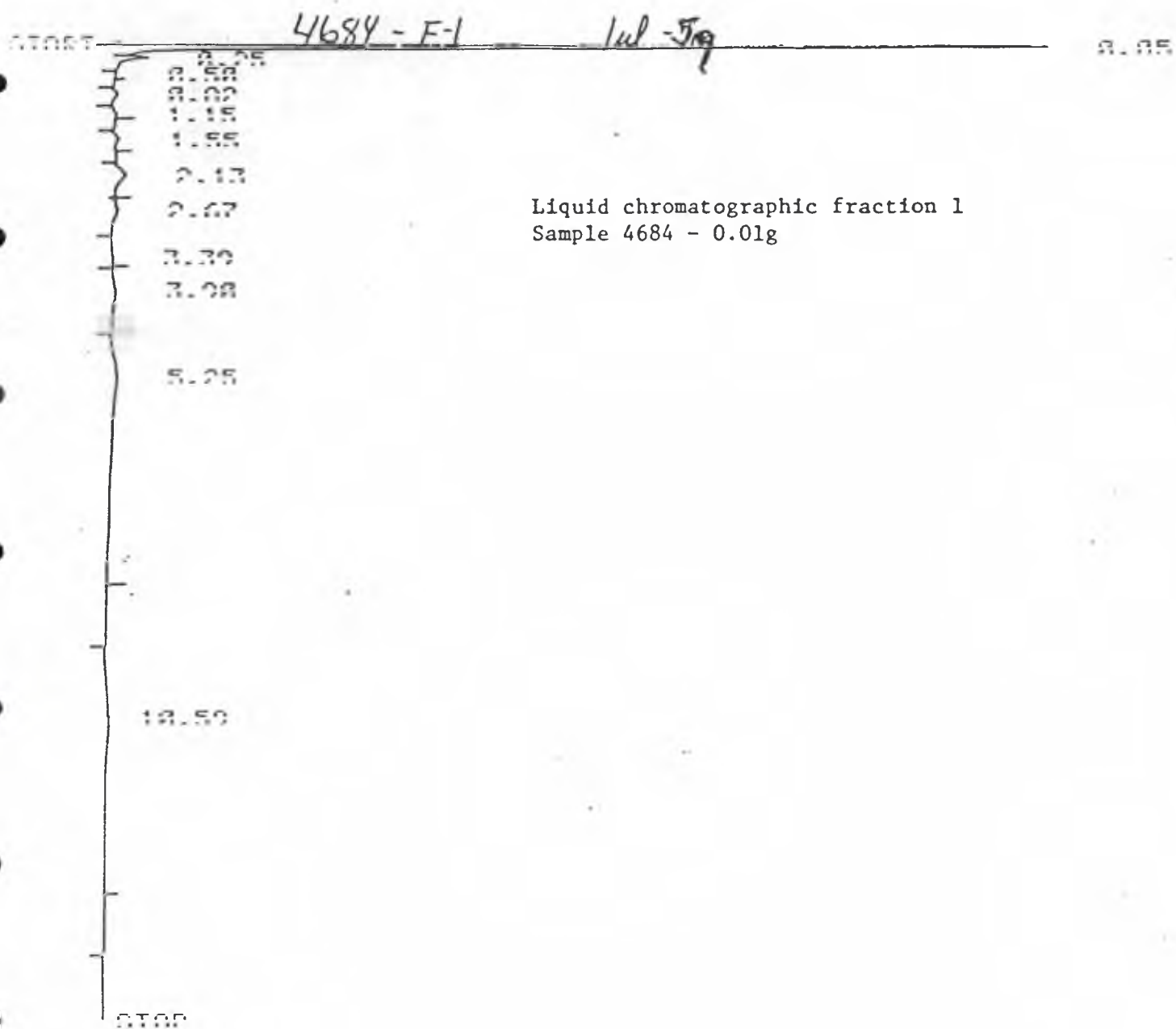


Figure 5. GLC chromatogram of a control sample of soil as analyzed for the determination of chlorinated hydrocarbon pesticides.

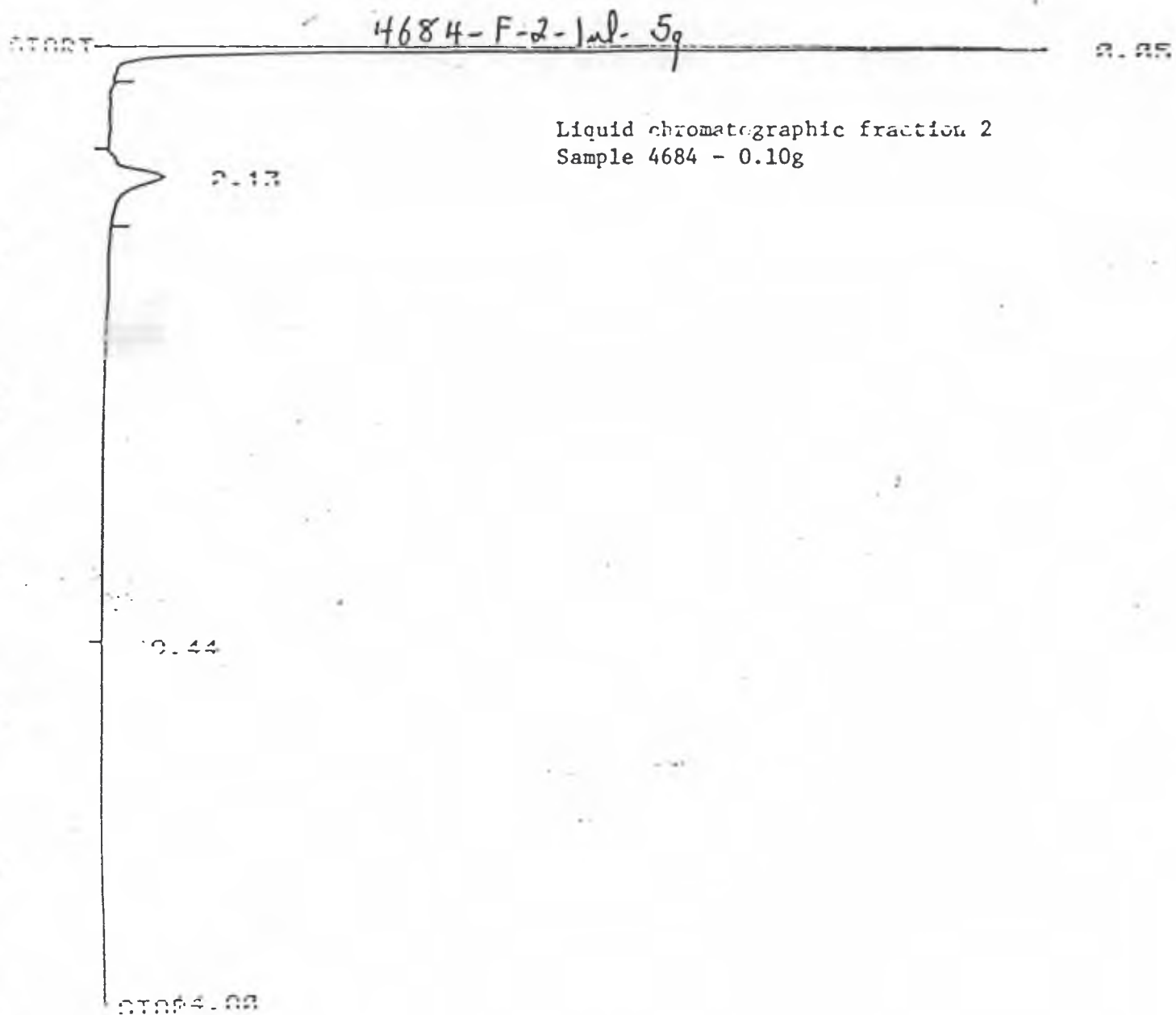


Figure 6. GLC chromatogram of a control sample of soil as analyzed for the determination of chlorinated hydrocarbon pesticides.

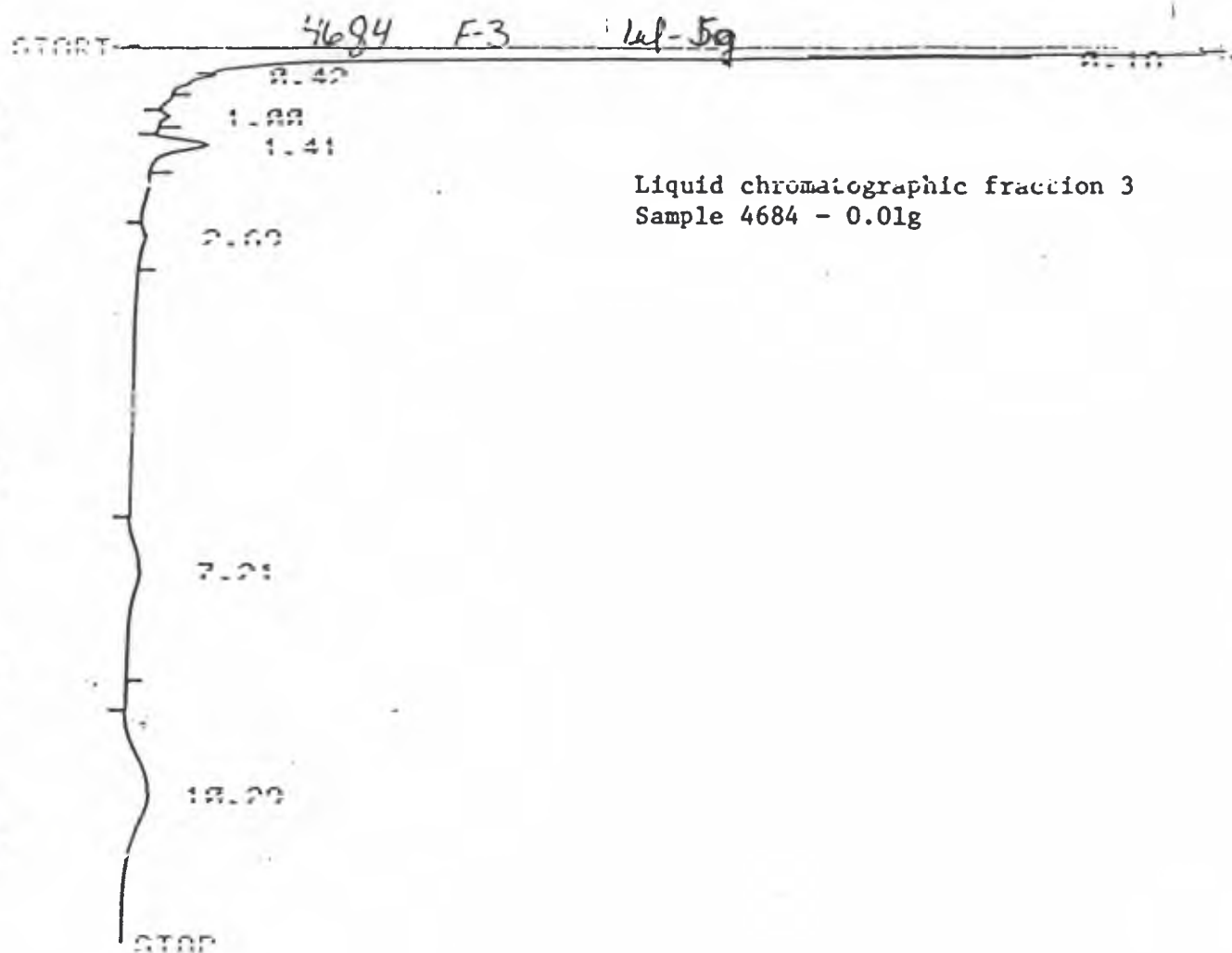


Figure 7. GLC chromatogram of a control samples of soil as analyzed for the determination of chlorinated hydrocarbon pesticides.

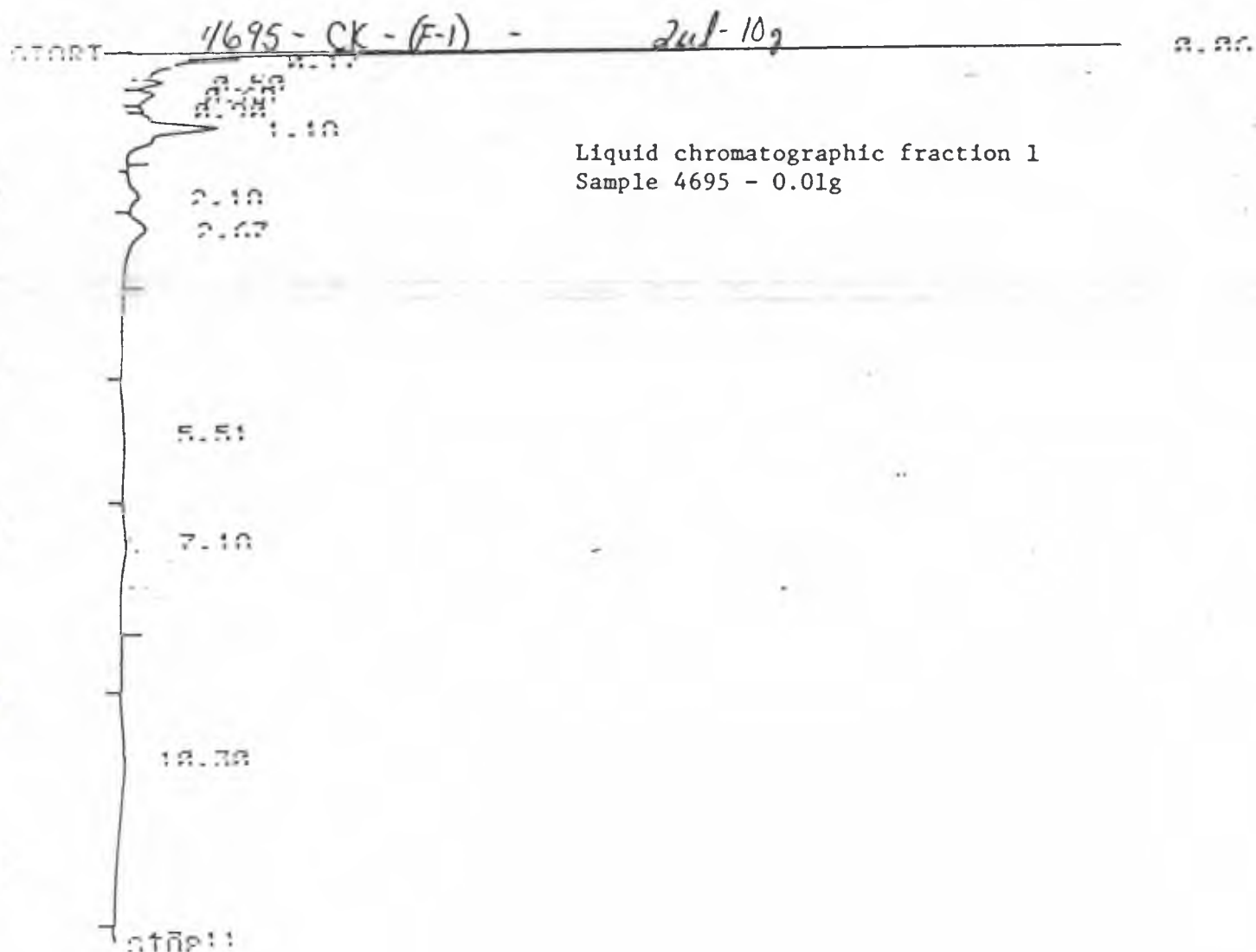


Figure 8. GLC chromatogram of a control sample of water as analyzed for the determination of chlorinated hydrocarbon pesticides.

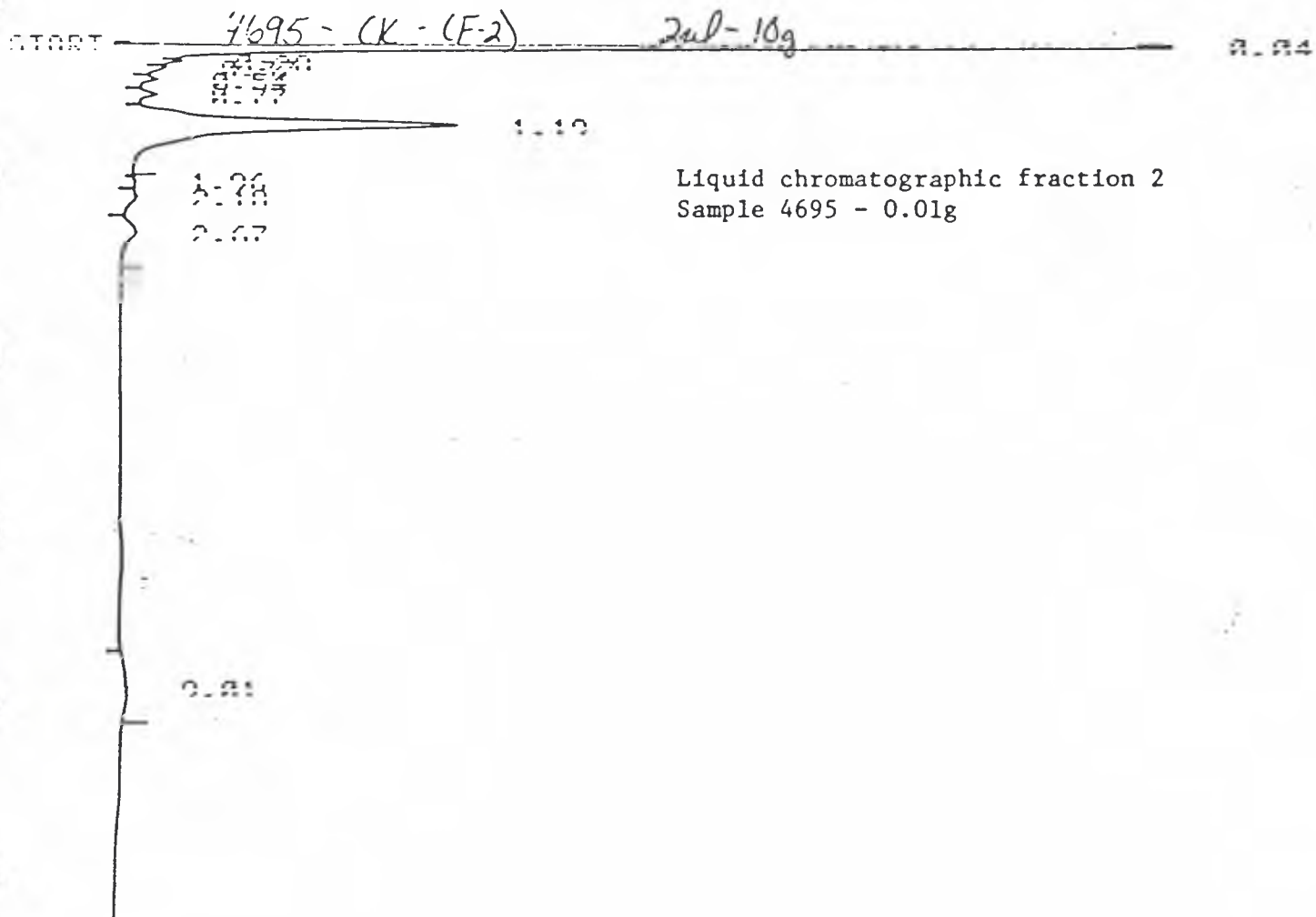


Figure 9. GLC chromatogram of a control sample of water as analyzed for the determination of chlorinated hydrocarbon pesticides.

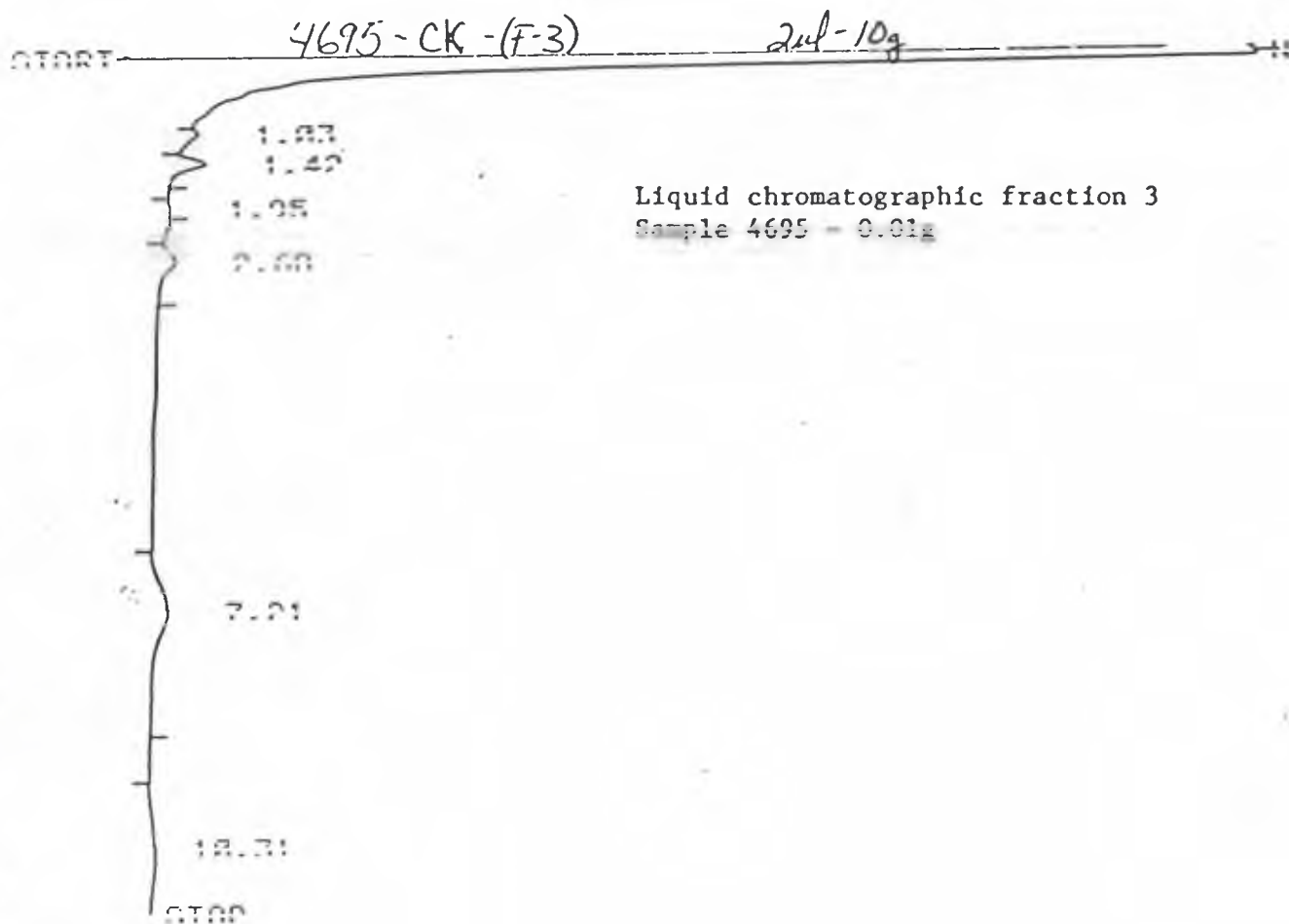


Figure 10. GLC chromatogram of a control sample of water as analyzed for the determination of chlorinated hydrocarbon pesticides.

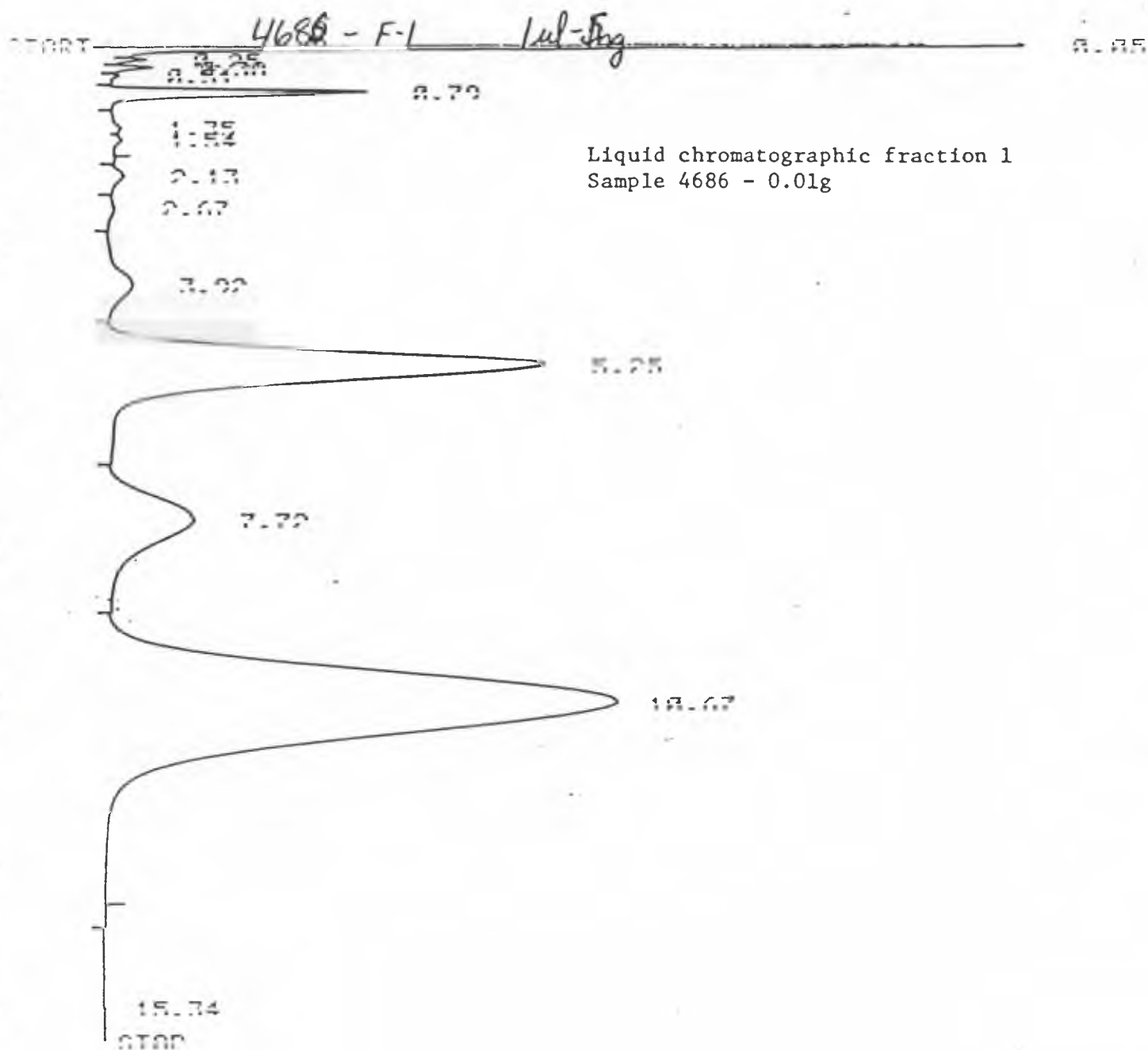


Figure 11. GLC chromatogram of soil sample B-1 as analyzed for the determination of chlorinated hydrocarbon pesticides.

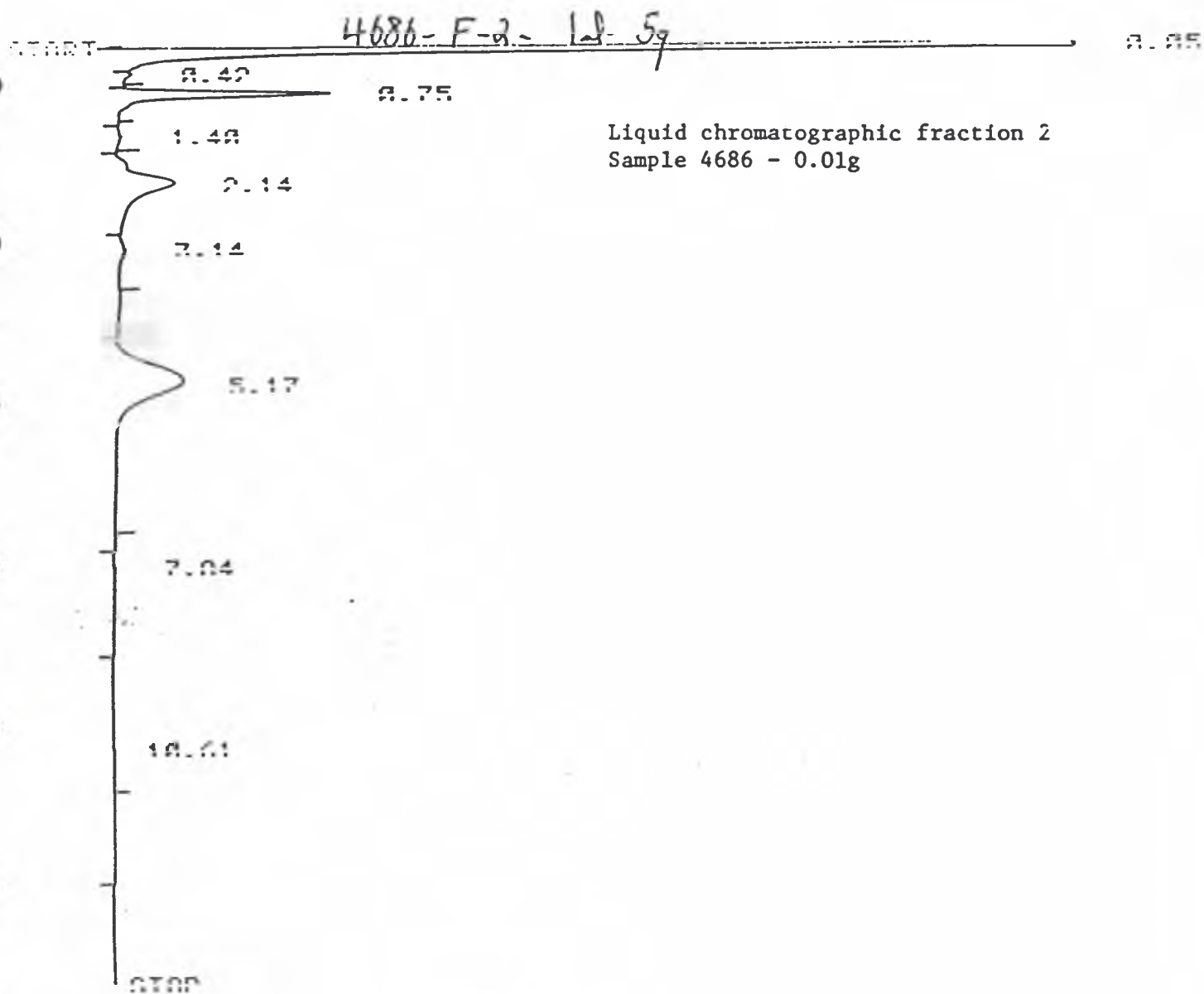


Figure 12. GLC chromatogram of soil sample B-1 as analyzed for the determination of chlorinated hydrocarbon pesticides.

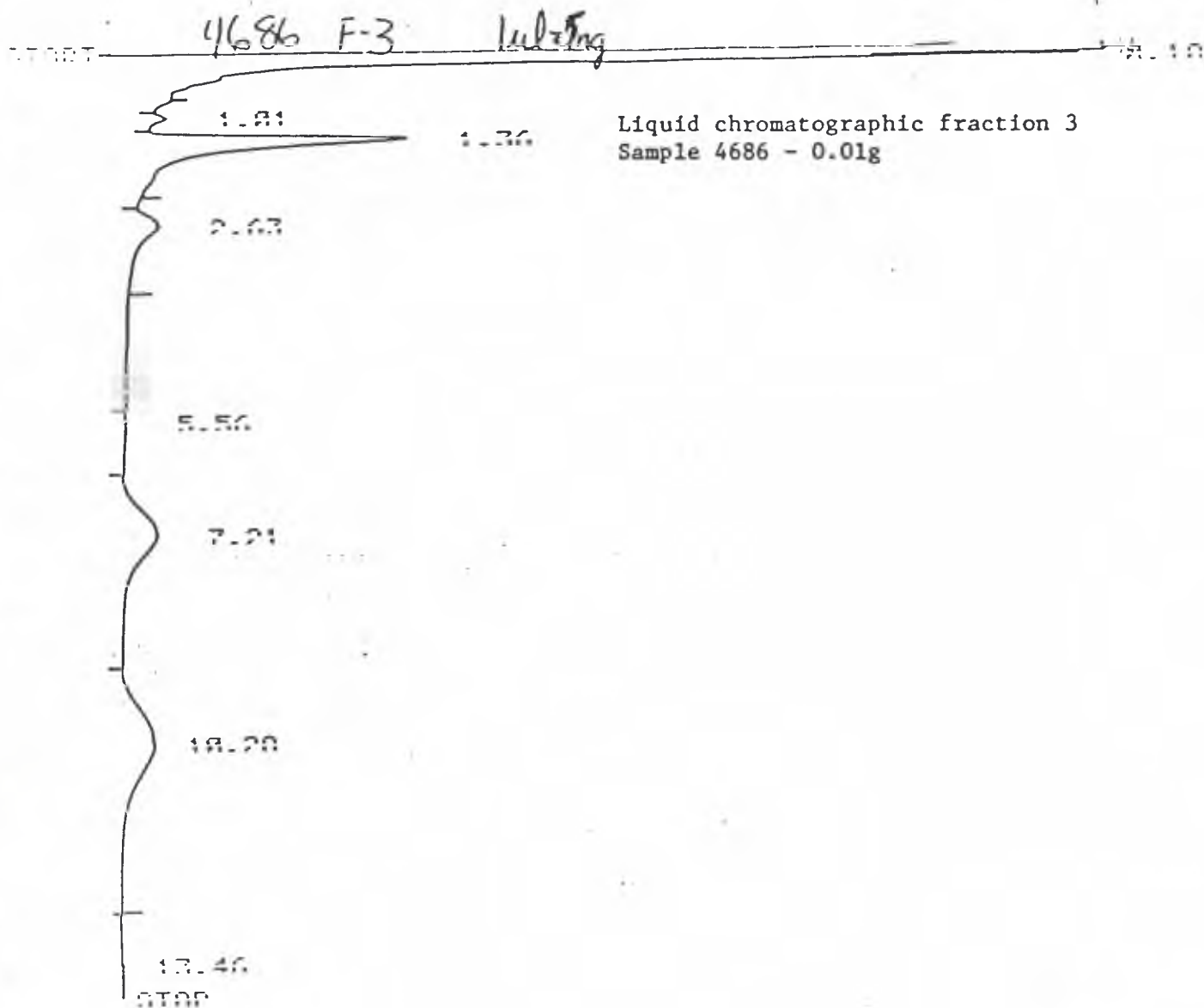


Figure 13. GLC chromatogram of soil sample B-1 as analyzed for the determination of chlorinated hydrocarbon pesticides.

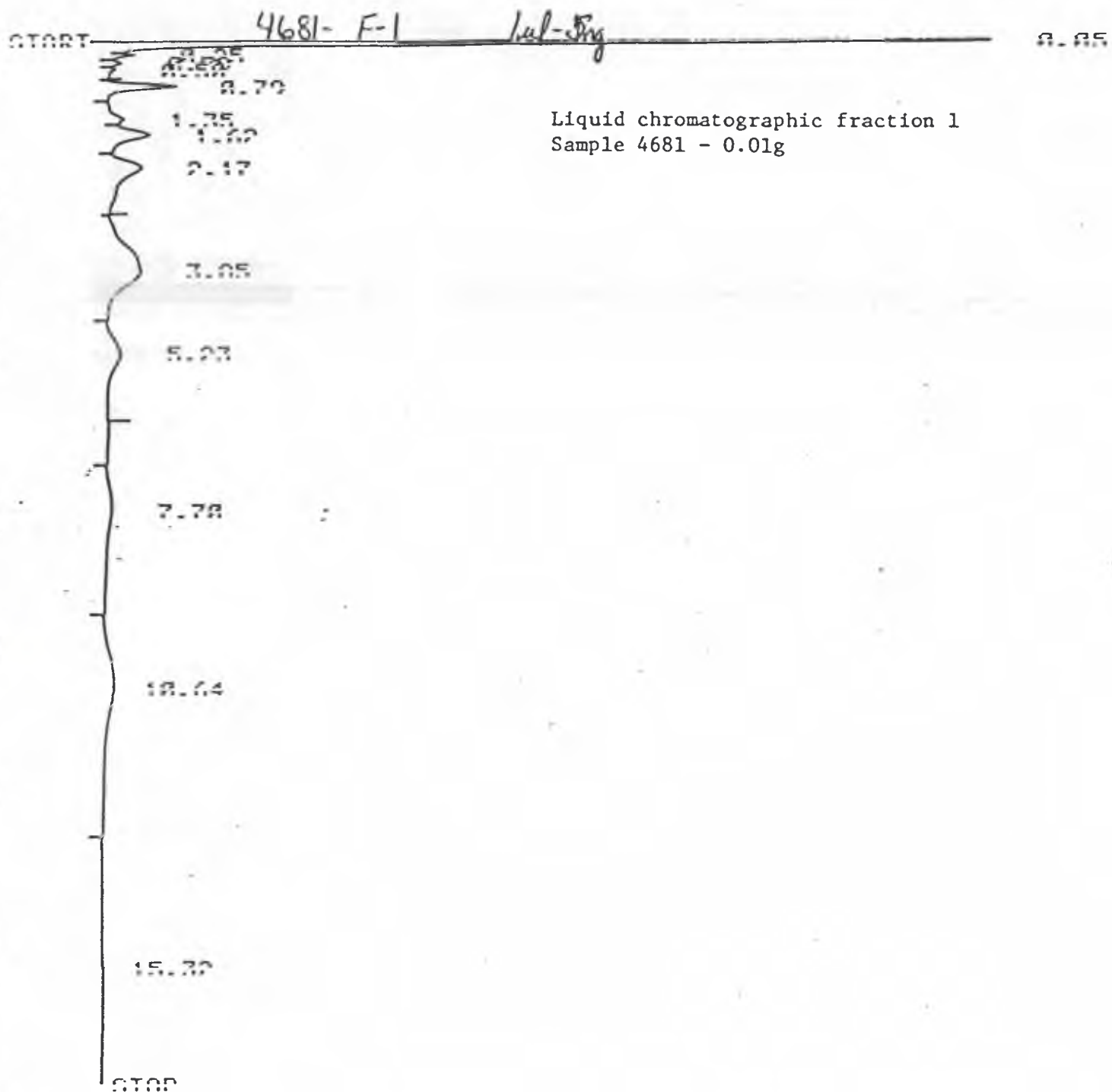


Figure 14. GLC chromatogram of soil sample B-2 as analyzed for the determination of chlorinated hydrocarbon pesticides.

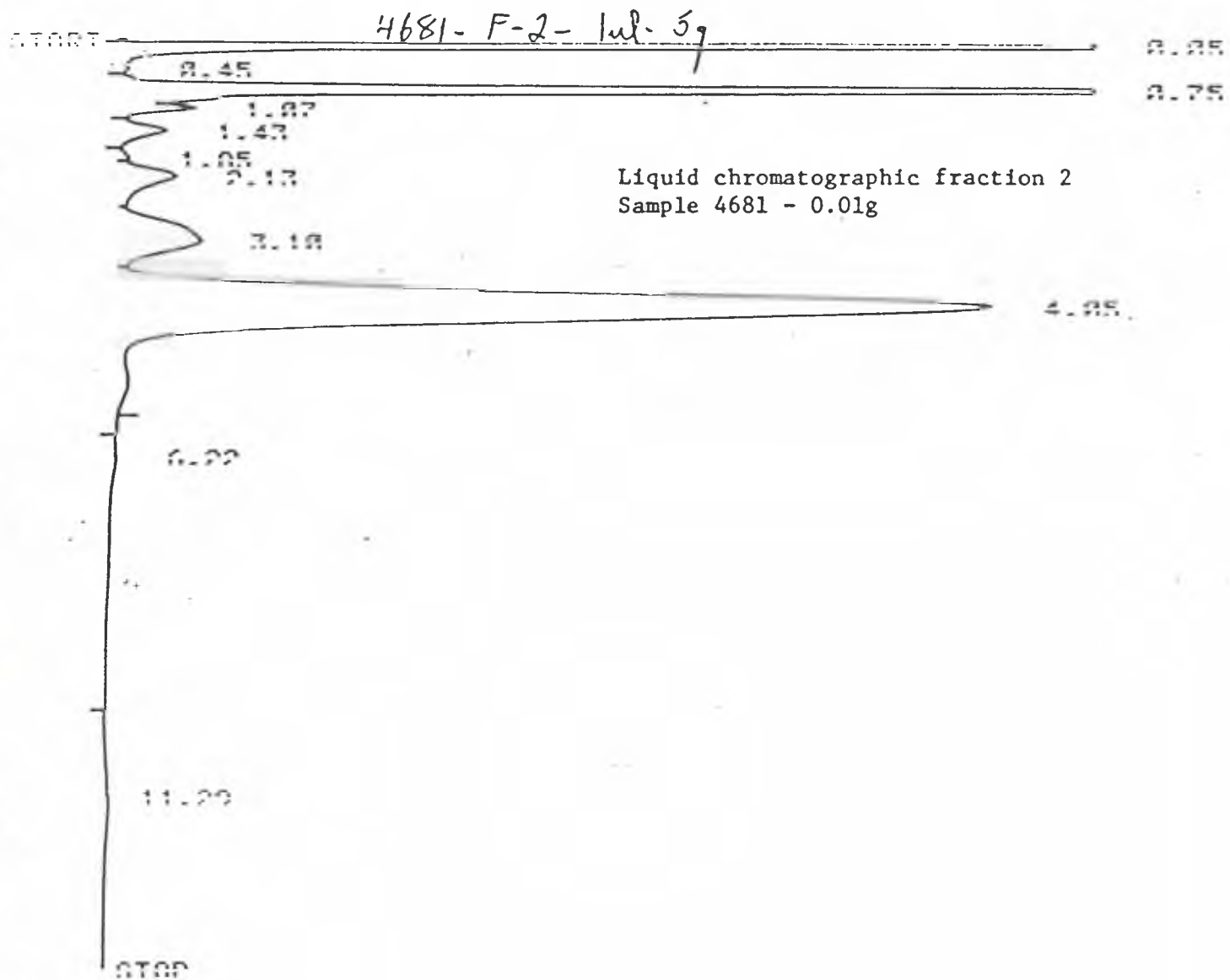


Figure 15. GLC chromatogram of soil sample B-2 as analyzed for the determination of chlorinated hydrocarbon pesticides.

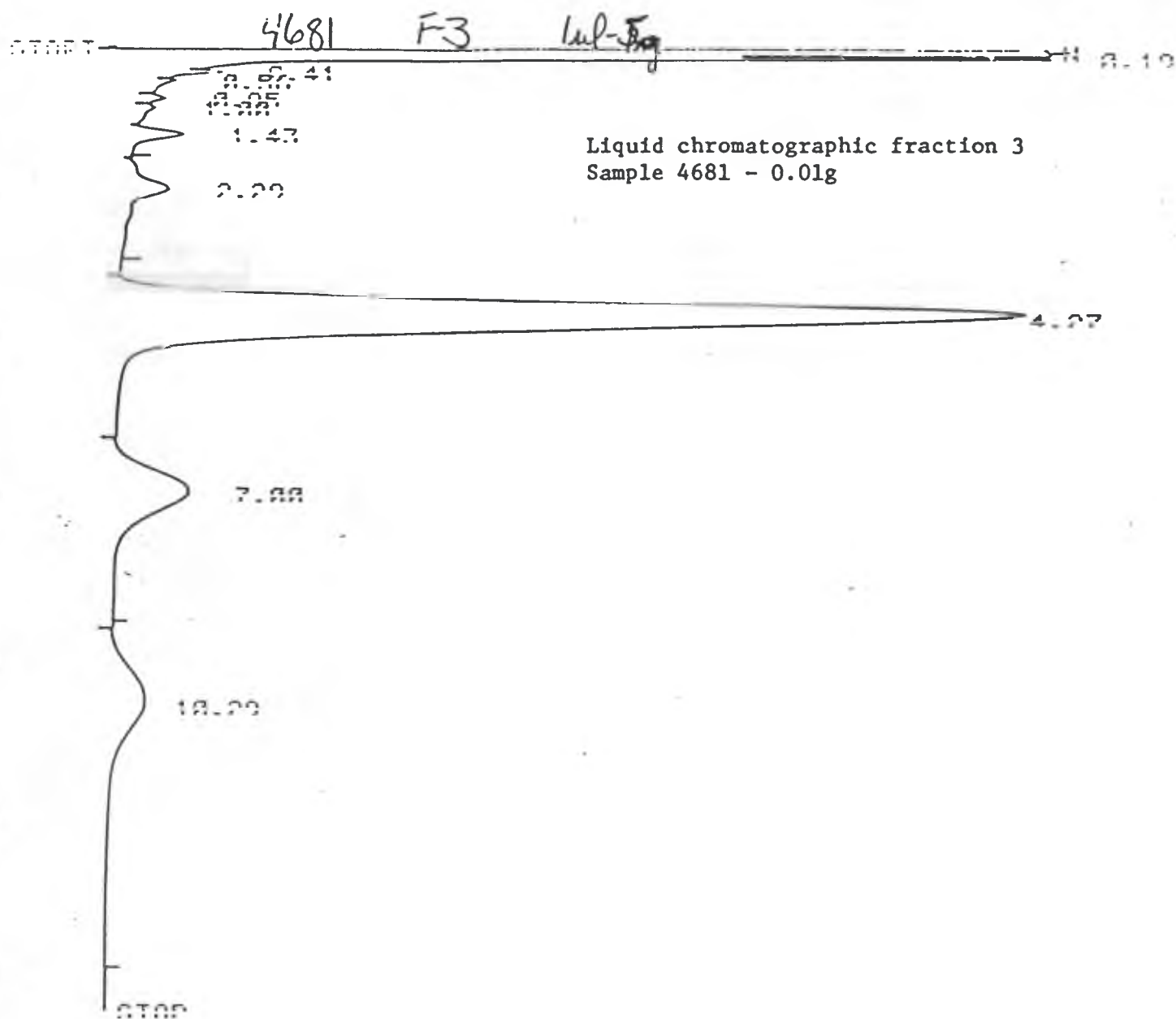


Figure 16. GLC chromatogram of soil sample B-2 as analyzed for the determination of chlorinated hydrocarbon pesticides.

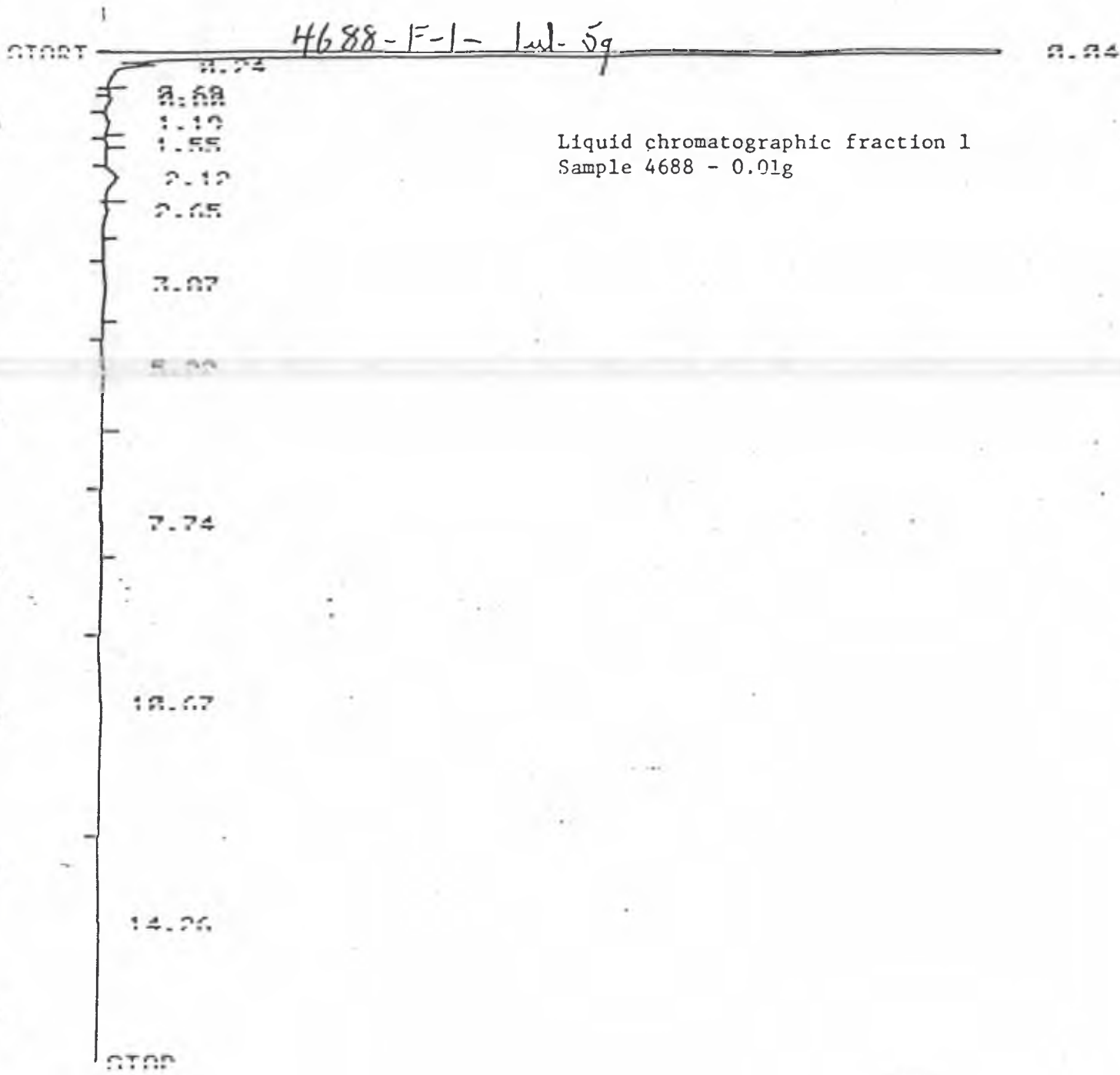


Figure 17. GLC chromatogram of water sample W-2 as analyzed for the determination of chlorinated hydrocarbon pesticides.

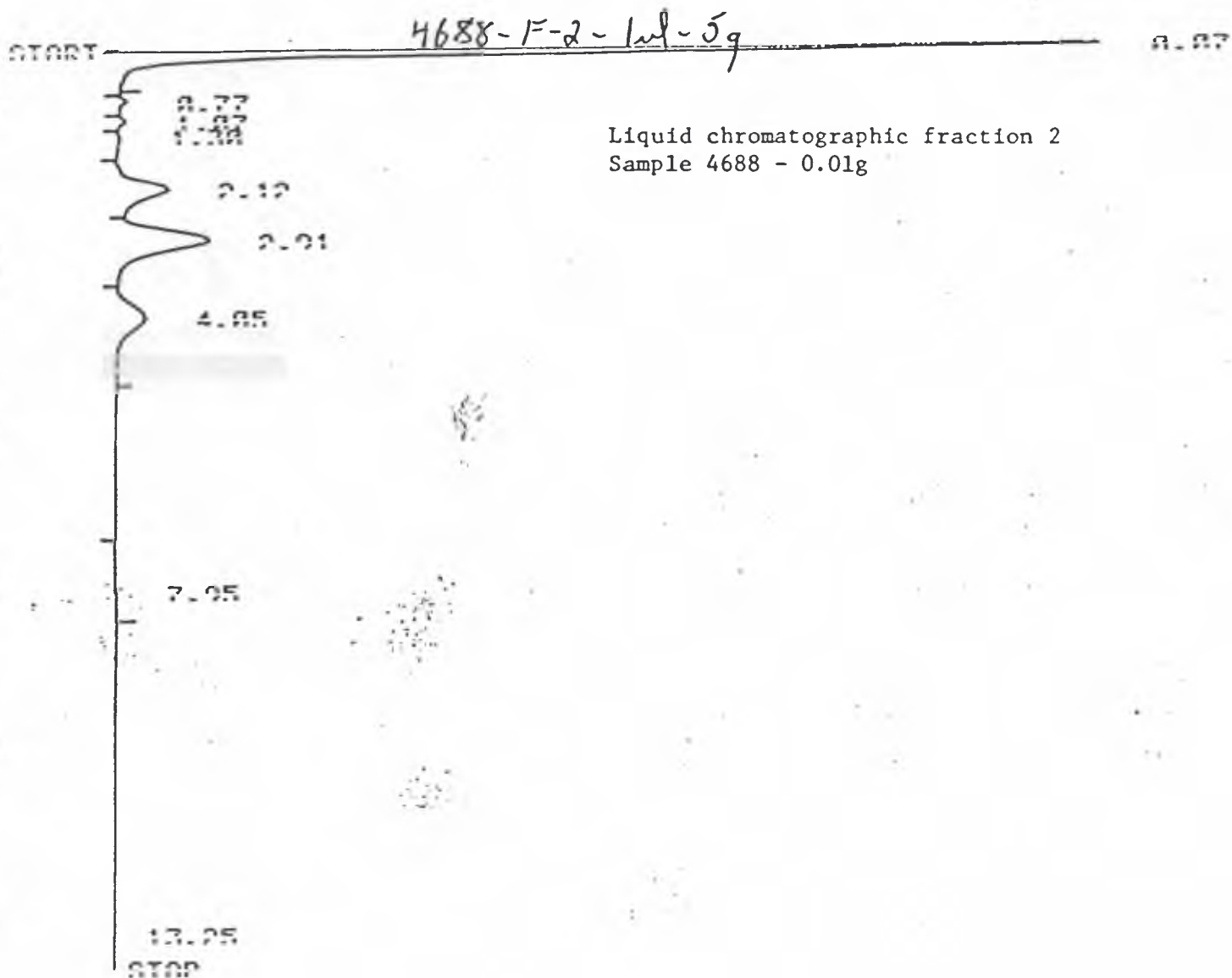


Figure 18. GLC chromatogram of water sample W-2 as analyzed for the determination of chlorinated hydrocarbon pesticides.

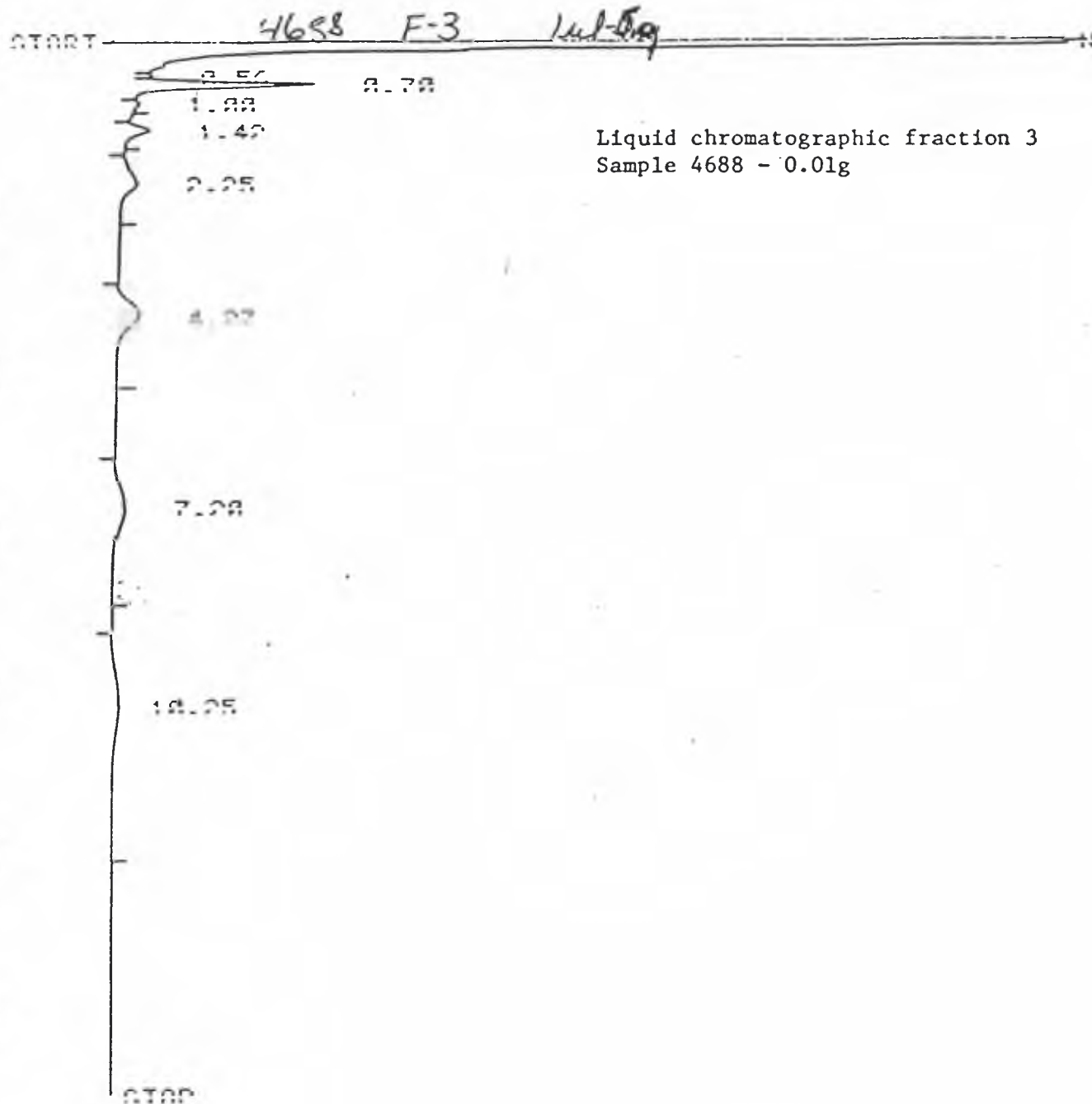


Figure 19. GLC chromatogram of water sample W-2 as analyzed for the determination of chlorinated hydrocarbon pesticides.

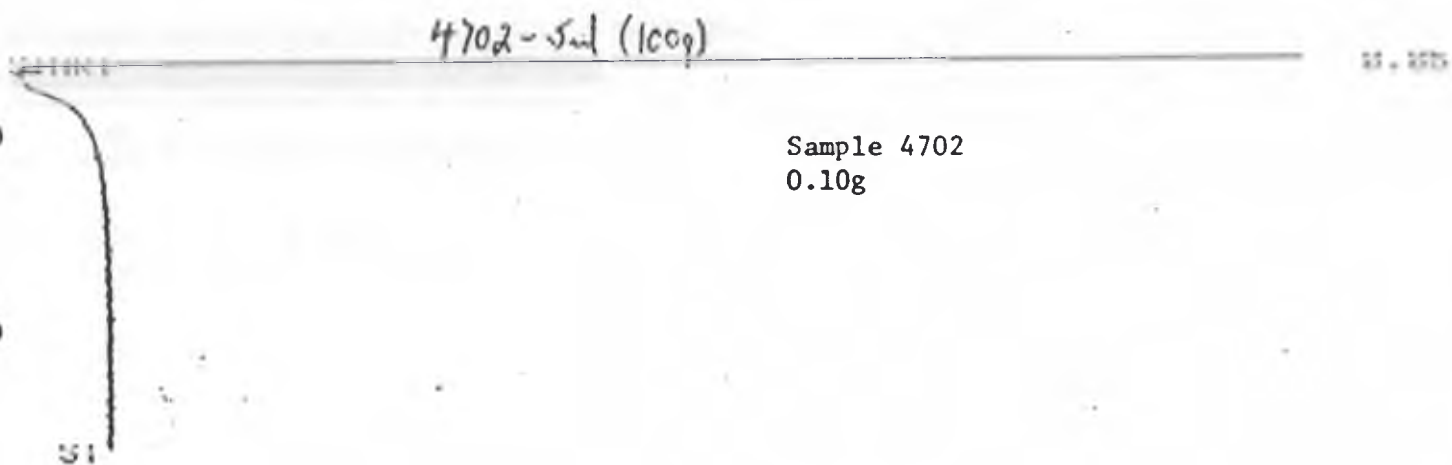


Figure 20. GLC chromatogram of soil sample B-1 as analyzed for the determination of organophosphate pesticides.

4703-5.1 (100g)

B.24

Sample 4703
0.10g

STOP

Figure 21. GLC chromatogram of soil sample B-2 as analyzed for the determination of organophosphate pesticides.

14704 - Sul (100g)

66. 64

Sample 4704
0.10g

5:00

Figure 22. GLC chromatogram of water sample W-2 as analyzed for the determination of organophosphate pesticides.

APPENDIX D

RESULTS OF PAH AND PESTICIDE ANALYSIS ON SOIL
AND WATER COLLECTED BY WASHINGTON DEPARTMENT OF ECOLOGY



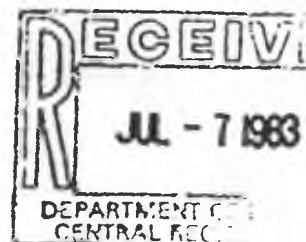
STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504 • (206) 753-2800

TO: Merley McCall *PAH not much*
FROM: D. Huntamer, Chemist *at - Pest*
SUBJECT: Organic Analyses of Dept. of Agriculture
Research Station Samples; Yakima, WA
DATE: April 19, 1983

Four samples were received at the EPA Region 10 Laboratory from WDOE Olympia on March 24, 1983 for analyses of polynuclear aromatic hydrocarbons (PAH) and pesticides. The results of the PAH analyses are attached. Pesticides results will be sent when completed. Note that a number of pesticides were seen in the tentatively identified compound list.

<u>EPA #</u>	<u>WDOE #</u>	
12589	None	Septic Tank - water
12590		Drainfield 26" from surface
12591		Drainfield 5 ft. from surface
12592		Hole #2 5.5 ft.



BASE/NEUTRAL COMPOUNDS

PROJECT: Yakima / WDOE COMPILED BY: J N Blazewich DATE: 4-18-83
 LABORATORY: EPA Region X REVIEWED BY: C. J. R. S. DATE: 4-18-83

SAMPLE # :	12589	12590	12591	12592			
UNITS :	mg/L	mg/Kg	mg/Kg	mg/Kg			
LOQ :							
1. acenaphthene	5u	2u	2u	2u			
2. benzidine	30u	25u	25u	25u			
3. 1,2,4-trichlorobenzene	5u	2u	2u	2u			
4. hexachlorobenzene	↓	4u	(16)	4u			
5. hexachloroethane	↓	2u	2u	2u			
6. bis(2-chloroethyl) ether	↓	↓	↓	↓			
7. 2-chloronaphthalene	↓	↓	↓	↓			
8. 1,2-dichlorobenzene	↓	↓	↓	↓			
9. 1,3-dichlorobenzene	↓	↓	↓	↓			
10. 1,4-dichlorobenzene	↓	↓	↓	↓			
11. 3,3'-dichlorobenzidine	↓	16u	16u	16u			
-12. 2,4-dinitrotoluene	11u	12u	12u	12u			
13. 2,6-dinitrotoluene	11u	12u	12u	12u			
14. 1,2-diphenylhydrazine (as azobenzene)	5u	2u	2u	2u			
15. fluroanthene	8u	↓	↓	(14)			
16. 4-chlorophenyl phenyl ether	↓	↓	↓	2u			

87.6% 71.2% 76.8% Solids

BASE/NEUTRAL COMPOUNDS (cont'd)

PROJECT: Yakima/WDOE COMPILED BY: JM Blazewich DATE: 4-18-83
 LABORATORY: EPA Region 8 REVIEWED BY: ABS DATE: 4-18-83

SAMPLE # :	12589	12590	12591	12592				
UNITS :	ug/L	ug/Kg	ug/Kg	ug/Kg				
LOQ :								
17. 4-bromophenyl phenyl ether	8u	2u	2u	2u				
18. bis(2-chloroisopropyl) ether	5u	↓	↓	↓				
19. bis(2-chloroethoxy) methane	↓	↓	↓	↓				
20. hexachlorobutadiene	8u	4u	4u	4u				
21. hexachlorocyclopentadiene	30u	30u	30u	30u				
22. isophorone	5u	2u	(6.2)	2u				
23. naphthalene	(350)	(8.8)	2u	2u				
24. nitrobenzene	5u	2u	↓	↓				
25. N-nitrosodimethylamine	—	—	—	—				
26. N-nitrosodiphenylamine	5u	4u	4u	4u				
27. N-nitrosodi-n-propylamine	↓	↓	↓	↓				
28. bis(2-ethyl hexyl) phthalate	(1260)	(290)	(190)	(140)				
29. butyl benzyl phthalate	5u	(11)	2u	2u				
30. di-n-butyl phthalate	↓	(25)	(14)	↓				
31. di-n-octyl phthalate	↓	2u	2u	↓				
32. diethyl phthalate	↓	↓	↓	↓				
33. dimethyl phthalate	↓	↓	↓	↓				
34. benzo(a)anthracene	↓	↓	↓	↓				
35. benzo(a)pyrene	↓	↓	↓	↓				
36. 3,4-benzofluoranthene	↓	↓	↓	↓				
37. benzo(k)fluoranthene	↓	↓	↓	↓				
38. chrysene	↓	↓	↓	↓				

BASE/NEUTRAL COMPOUNDS (continued)

PROJECT: Yakima/ WDOE COMPILED BY: JN Blazewich DATE: 4-18-83
 LABORATORY: EPA Region X REVIEWED BY: CRB DATE: 4-18-83

SAMPLE # :	12589	12590	12591	12592				
UNITS :	ug/l	ng/kg	ug/kg	ug/kg				
LOQ :								
39. acenaphthylene	5u	2u	2u	2u				
40. anthracene	8u	6u	6u	6u				
41. benzo(ghi)perylene	↓	25u	25u	25u				
42. fluorene	↓	8u	8u	8u				
43. phenanthrene	↓	↓	↓	↓				
44. dibenzo(a,h)anthracene	15u	25u	25u	25u				
45. ideno(1,2,3-cd)pyrene	15u	↓	↓	↓				
46. pyrene	(25)	4u	4u	4u				
47. TCDD	ND	ND	ND	ND				

ACID COMPOUNDS

PROJECT: Yakima/WDCE COMPILED BY: JMB/azurich DATE: 4-18-83
 LABORATORY: EPA Region X REVIEWED BY: dB DATE: 7-18-83

SAMPLE # :	12589	12590	12591	12592				
UNITS :	ug/L	ug/Kg	ug/Kg	ug/Kg				
LOQ :								
1. 2,4,6-trichlorophenol	8u	12u	12u	12u				
2. p-chloro-m-cresol	5u	8u	8u	8u				
3. 2-chlorophenol	↓	2u	2u	2u				
4. 2,4-dichlorophenol	↓	12u	12u	12u				
5. 2,4-dimethyl phenol	8u	8u	8u	8u				
6. 2-nitrophenol	15u	20u	20u	20u				
7. 4-nitrophenol	8u	4u	4u	4u				
8. 2,4-dinitrophenol	30u	30u	30u	30u				
9. 4,6-dinitro-o-cresol	↓	↓	↓	↓				
10. pentachlorophenol	15u	35u	35u	35u				
11. phenol	5u	2u	2u	2u				

PESTICIDES

PROJECT: Yakima Agric Lipt COMPILED BY: D. F. Hunter

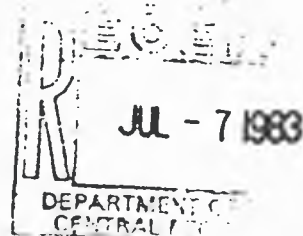
DATE: 6/30/83

LABORATORY: EPA Region X REVIEWED BY: RAH

DATE: 7/1/83

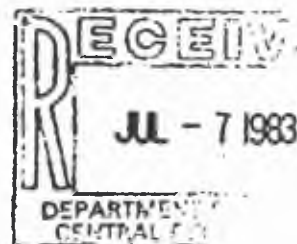
SAMPLE #	:	12589	12590	12591	12592				
UNITS	:	μg/kg	μg/kg	μg/kg	μg/kg				
LOQ	:	100%*	87.6%	71.2%	76.8%				
. aldrin		(12)	(87)	3u	1u				
. dieldrin		(11)	1u	3u	3u				
. chlordane		3u	2u	3u	1u				
. 4,4'-DDT		(1020)	(3000)	(47)	1u				
. 4,4'-DDE		3u	(1600)	(25)	(12)				
. 4,4'-DDD		(37)	(660)	3u	(7)				
. -endosulfan I		(280)	(180)	(15)	(37)				
. -endosulfan II		(1070)	1u	(360)	(300)				
. endosulfan sulfate		(12)		(140)	3u				
. endrin		(35)		3u	3u				
. endrin aldehyde		3u			3u				
. heptachlor		↓			1u				
. heptachlor epoxide		↓			1u				
. - BHC A		(45)			(18)				
. - BHC B		(54)	↓	↓	3u				
. - BHC G		(130)	(14)	(83)	(94)				
. - BHC D		3u	1u	3u	1u				
. PCB - 1242		70u	50u	50u	10u				

* Oil - Calculated on WT/WT basis



PROJECT: Yakima Agric. Dept COMPILED BY: D. NantawerDATE: 6/30/83LABORATORY: EPA Region X REVIEWED BY: OGHDATE: 7/1/83

SAMPLE #	:	12589	12590	12591	12592			
UNITS	:	Dry wt $\mu\text{g}/\text{kg}$	$\mu\text{g}/\text{kg}$	$\mu\text{g}/\text{kg}$	$\mu\text{g}/\text{kg}$			
LOQ	:							
19. PCB - 1254		70u	50u	50u	10u			
20. PCB - 1221								
21. PCB - 1232								
22. PCB - 1248								
23. PCB - 1260				-				
24. PCB - 1016		↓	↓	↓	↓			
25. toxaphene		210u	150u	150u	30u			
26. Diazinon		32800	10u	340	190			
27. Malathion		10u		10u	10u			
28. Parathion		3700u		10u				
29. Disulfoton		3000		10u	↓			
30. Chlorpyrifos		12000	↓	290	16			
31.								



INITIALLY IDENTIFIED COMPOUNDS

PROJECT: Yakima/WDOE COMPILED BY: JM Blazewich DATE: 4-18-83
 LABORATORY: EPA Region V REVIEWED BY: PPS DATE: 4-8-83

ACID/NB FRACTION	SAMPLE # :		12589	12590	12591	12592			
CAS #	NAME	# identified # analyzed	16 139	9 35	5 57	3 36			
1. -47-6	0-Xylene	estimate 1500 ug/L	ND	ND	ND				
2. -14-3	1-ethyl-2-methyl- benzene	estimate 5200 ug/L							
3. -41-9	1-ethyl-2,4-dimethyl- benzene	estimate 11000 ug/L							
4. -88-9	2-ethyl-3,4-dimethyl- benzene	estimate 3300 ug/L							
5. -23-3	1,2,3,4-tetramethyl- benzene	estimate 3500 ug/L							
6. -12-0	1-methyl- naphthalene	estimate 5500 ug/L							
7. -76-5	1H-anthracene, 2,3-dimethyl-	estimate 3200 ug/L							
8. -61-9	1,5-dimethyl naphthalene	estimate 8300 ug/L							
9. -98-8	1,2-dimethyl- naphthalene	estimate 19000 ug/L							
10. -14-6	2,4-dichlorophenoxy- acetic acid, 2-butyl- propyl ester	estimate 33000 ug/L		estimate 46 ug/Hg					

INITIATIVELY IDENTIFIED COMPOUNDS

PROJECT: Nakema WDOE COMPILED BY: JM Blaylock DATE: 4-18-83
 LABORATORY: EPA Region X REVIEWED BY: 905 DATE: 4-18-83

ACID/NB FRACTION	SAMPLE # :	12589	12590	12591	12592				
CAS #	NAME								
2921	phosphorothioic acid, 0,0-dichloro-0-(3,5,6-trichloro-2-pyridyl)ester	estimate 58000 ug/l	ND	estimate 320 ug/kg	ND				
11. -88-2	[Chlorpyrifos (Dursban)]	X		X	↓				
298	phosphorodithioic acid, 0,0-diethyl-S-[2-(ethylthio)ethyl] ester	estimate 43000 ug/l		estimate 240 ug/kg	estimate 95 ug/kg				
12. -04-4	[Disulfoton or (disyston)]	X		X	X				
2131	1,4,5-trimethyl naphthalene	estimate 24000 ug/l		ND	ND				
13. -41-1									
4920	1-ethyl-3-(1-methyl-ethyl) benzene	estimate 1400 ug/l		↓	↓				
14. -99-4									
333	phosphorothioic acid, 0,0-diethyl-O-(2-methyl-2-[(1-methyl-ethyl)-4-pyrimidinyl] ester	estimate 85000 ug/l		estimate 460 ug/kg	estimate 350 ug/kg				
15. -41-5				X	X				
X.	[Diazinon]	X		X	X				
53467	2,4-dichlorophenoxyacetic acid, propylene glycol butyl ether ester	estimate 23,000 ug/l	↓	estimate 86 ug/kg	ND				
16. -11-1									
72			estimate 6600 ug/kg						
17. -55-9	PP DDE	ND		ND	↓				

INITIATIVELY IDENTIFIED COMPOUNDS

PROJECT: Yakima WDOE COMPILED BY: JM Blazewich DATE: 4-18-83
 LABORATORY: EPA Region X REVIEWED BY: CRS DATE: 4-18-83

ACID/NB FRACTION	SAMPLE # :	12589	12590	12591	12592				
CAS #	NAME								
7527 18. -12-8	O,p'-DDD	ND	Trace	ND	ND				
72 19. -54-8	O,p'-DDD		estimate 2000 ug/Kg						
789 20. -02-6	O,p'-DDT		estimate 3200 ug/Kg						
50 21. -29-3	P,p'-DDT		estimate 15000 ug/Kg						
1610 22. -18-0	6-methoxy-N,N'-bis (1-methylethyl)-1,3,5- triazine-2,4-diamine [Prometon (Promitol)]		estimate 900 ug/Kg						
79 23. -01-6	trichloroethene		estimate 400 ug/Kg						
930 24. -68-7	2-cyclohexen-1-one		estimate 190 ug/Kg						
3567 25. -16-6	Benzophenone 4-chloro- 2-(4-chlorophenyl)- ethoxy		estimate 130 ug/Kg	↓	↓				
4891 10. -54-7	Phosphoric acid O,O-methyl O-1,2-ethyl- sulfonyl ethyl ester	↓	ND	↓	estimate 160 ug/Kg				

APPENDIX E

YAKIMA AGRICULTURAL RESEARCH LABORATORY
VISUAL SITE INSPECTION PHOTO LOG

YARL
VSI PHOTO LOG
9 SEPT 1987

ROLL #1

Photo #

1. Pesticide storage room.
2. Septic tank / drainfield system, facing southeast.
3. Septic tank / drainfield system, facing west.
4. Mixed solvent and pesticide waste, 5-gal drum storage.

YARL
VSI PHOTO LOG
9 SEPT 1987

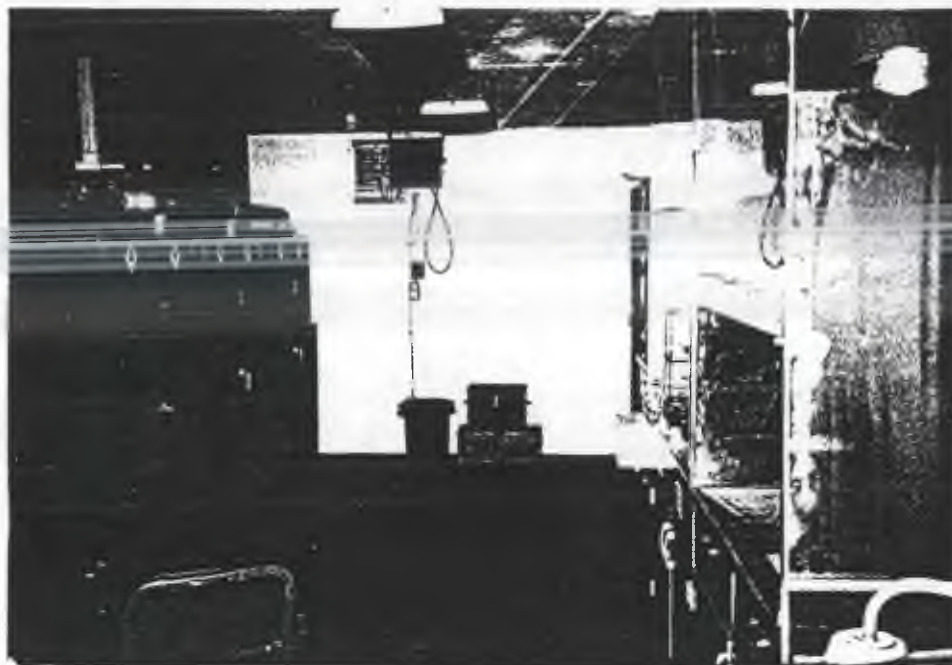


Photo 3. Pesticide storage room.

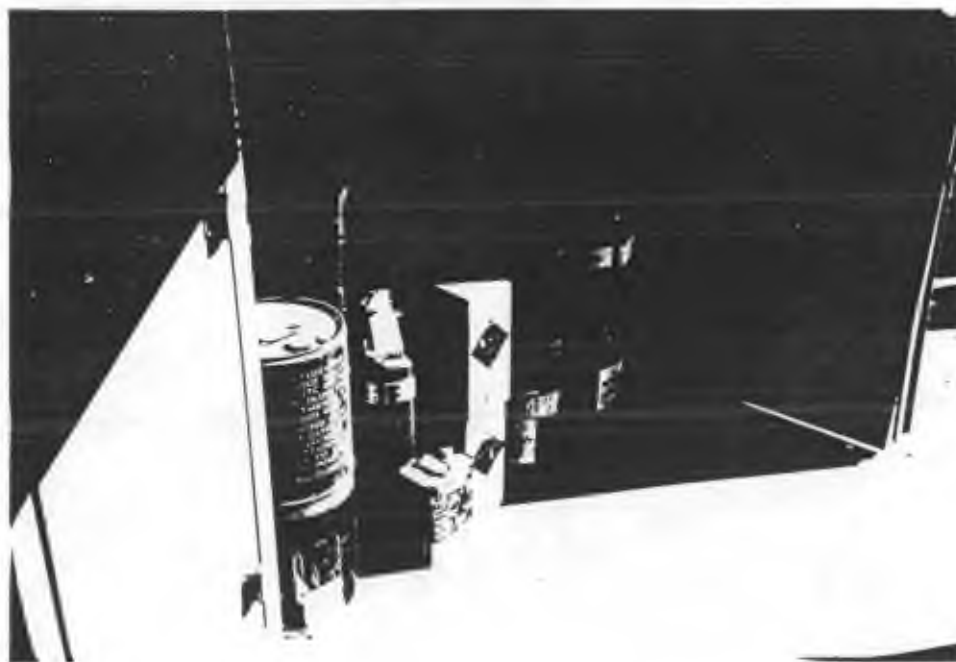


Photo 4. Mixed solvent and pesticide waste, 5-gal drum storage.

YARL
VSI PHOTO LOG
9 SEPT 1987

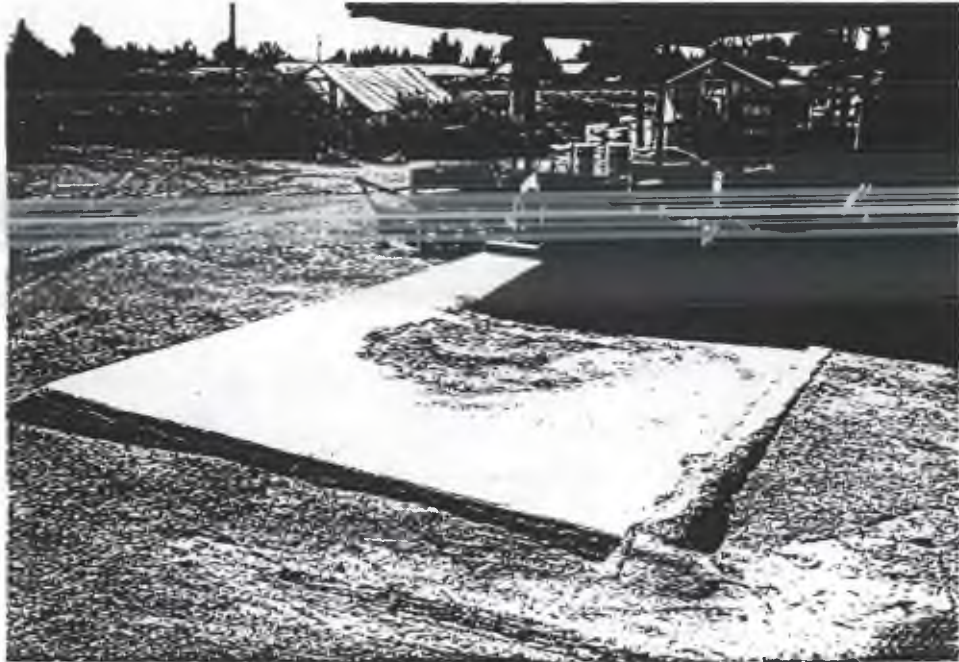


Photo 1. Septic tank / drainfield system, facing southeast.



Photo 2. Septic tank / drainfield system, facing west.